Technical Manual for the Delaware School Survey: Scales of School Climate; Bullying Victimization; Student Engagement; Positive, Punitive, and Social Emotional Learning Techniques; and Social and Emotional Competencies

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November 2016

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Delaware Positive Behavior Support (DE-PBS) and
School Climate & Student Success (SCSS) Projects
A collaboration between
the Center for Disabilities Studies at the University of Delaware
and the Delaware Department of Education (DDOE), with funding from the
DDOE and a federal School Climate Transformation Grant awarded to the DDOE
(Grant # S184F140038 – 15)

Acknowledgements

Parts of this manual were taken from manuscripts published by one or more of the authors, which were written without funding support. However, the development of Delaware School Surveys, the statistical analyses reported, and most of the writing of the manual were supported with funding from the Delaware Department of Education (DDOE) via the Delaware Positive Behavior Support Project (DE-PBS) at the University of Delaware's Center for Disabilities Studies and a School Climate Transformation grant awarded to the DDOE by the United States Department of Education. We would like to express sincere appreciation to the Department of Education for its support. Two people in particular were most recently instrumental in bringing this manual to fruition: DE-PBS Co-Project Director, Linda Smith and the DDOE's Director of Exceptional Children Resources, Mary Ann Mieczkowski. Both have steadfastly supported the development of the Delaware School Surveys and this manual.

Multiple others at the DE Department of Education and the UD Center for Disabilities Studies have been instrumental in the support and development of the surveys, including the following:

Department of Education:

Michael Watson, *Chief Academic Officer, Teaching and Learning Branch*
Dr. Martha Brooks, *Past Director of Exceptional Children Resources and Associate Secretary, Teaching and Learning Branch*
Martha Toomey, *Past Director of Exceptional Children Resources*
Brian Touchette, *Past Director, Office of Assessment*
John Sadowski, *Education Associate, School Climate and Discipline*

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CHAPTER 1
OVERVIEW OF SURVEYS AND SUPPORTING RESEARCH

Overview

This chapter describes the 2016 *Delaware School Surveys* (DSS), including each of its five scales, and reviews theory and research supporting the scales and their subscales. The following chapters present recent evidence supporting the validity and reliability of scores for purposes used in schools. Such evidence is based on analyses of results of the surveys administered in 2015, which included all items on the 2016 survey and other items that were field-tested that year (note that as a result of our analyses some of those items were deleted and do not appear on the 2016 surveys while several other items were moved to different subscales).

The 2016 *Delaware School Surveys* (DSS) are comprised of five separate scales:

- *Delaware School Climate Scale (DSCS);*
- *Delaware Bullying Victimization Scale (DBVS);*
- *Delaware Student Engagement Scale (DSES);*
- *Delaware Positive, Punitive, and Social Emotional Learning (SEL) Techniques Scale (DTS);* and
- *Delaware Social and Emotional Competencies Scale (DSECS)* (new for 2016).

One or more of these scales are found on each of the Student, Teacher/Staff, and Home versions of the surveys (see Table 1.1 for list of scales and subscales).

Attractive Features of the Surveys

- The surveys are designed for **students in *grades 3-12***, and for **teachers/staff** and **parents of *all grades***.
- The surveys are ***brief***: Completion of the *School Climate Scale* takes 10-15 minutes, and each of the other four scales take about 5 minutes.
- The surveys are ***free*** to the public (note that scoring services, however, are available only to Delaware schools). For copies of surveys see http://wh1.oet.udel.edu/pbs/school-climate/administration-of-survey/
- The same items are used across grade levels, and across student, teacher/staff, and home versions. This **allows for *comparisons between those groups***.
- The scales and subscales are ***aligned with goals commonly targeted in the School-wide Positive Behavior and Intervention Supports (SWPBIS) and the Social and Emotional Learning (SEL) approaches*** to school discipline and prevention and with many bullying prevention programs.
- Whereas the multiple scales of the surveys (e.g., 5 on the student version) are typically administered together, ***each scale also can be used separately***. For example, a school interested only in bullying, might use the *Delaware Bullying Victimization Scale* and not the other four scales.

- All versions are ***completed via computer (using Qualtrics), or via hard copy***. In Delaware, both formats are used for the student and home versions; only the computer format is used for the teacher/staff version.
- ***Detailed reports of scores*** are given to Delaware schools, including scores that allow schools to examine scores by grade, gender, and racial/ethnic groups while comparing scores to state norms.
- ***Supported by theory and research***, including studies of validity and reliability published in peer-reviewed journals.

Uses

The surveys are intended to provide schools with useful information for needs assessment, program development, and program evaluation, and particularly in programs for preventing bullying and other behavior problems and for promoting social and emotional competencies. For example, scores on the *School Climate Scale* might indicate if a school needs to devote greater attention to important areas of school climate, including teacher-student relations, student relations, school safety, clarity of expectations, fairness of rules, and teacher-home communications. Scores on this scale and additional scales of the surveys also would indicate if increased attention should be given to bullying victimization; student engagement; the school's use of positive, punitive, and social emotional learning (SEL) techniques; and to developing students' social and emotional competencies.

In Delaware, survey data might also be used for evaluation purposes as part of the consolidated application to the Delaware Department of Education (DDOE) to show growth in school climate/discipline. Similarly, schools may also use the data for their school improvement plans.

Although the three versions of the survey may be used alone, they are intended to be used together and in combination with other measures of program effectiveness. Using the student, teacher/staff, and home surveys in combination allows school teams to compare and contrast different perspectives and often increases validity of the assessment of school climate, particularly when views converge. The surveys should be used in combination with other assessment data, such as discipline-related data (e.g., number of office disciplinary referrals, suspensions) and academic achievement data. In Delaware, additional assessments might include the *Delaware Assessment of Strengths and Needs for Positive Behavior Supports* (a staff self-assessment survey) and the *DE-PBS Key Feature Evaluation* (an external evaluation of school-wide PBS implementation) (see http://wh1.oet.udel.edu/pbs/wp-content/uploads/2013/10/KFE-Process-2013-14.docx).

In Delaware, the surveys are administered through the partnership between the DDOE, the DE-PBS project and School Climate & Student Success project housed at the University of Delaware's Center for Disabilities Studies. Participation is voluntary, although some school districts require it. Approximately 70% - 80% of Delaware public schools have participated in recent years. All survey costs have been covered by the DDOE, and more recently also by a U.S. Department of Education School Climate Transformation Grant. This includes the costs of survey forms and data processing, generating individual reports for participating schools

(distributed in May), providing a state-wide workshop to participating schools to assist in score interpretation, and making continued improvement in the surveys.

Why Develop New Surveys?

Although interest in school climate assessment has certainly increased in recent years, the measures used to assess this construct often lack evidence of validity (e.g., Horner, et al., 2009) or are limited in scope (e.g., assessing teachers' perceptions with domains of little relation to the program's goals). According to Cohen et al. (2009), although 29 states made one or more school climate measures available or mandatory in their schools, only one state used a valid and reliable measure. More recently, the Department of Education's Safe and Supportive Schools' project has provided a reference list of school climate surveys (*School Climate Survey Compendium (http://safesupportiveschools.ed.gov/)*. Except for the *California School Climate Survey* (CSCS; Furlong et al., 2005), the *Effective School Battery-Teacher Inventory* (ESB-TI; Gottfredson, et al, 2005), and the *Communities That Care Youth Survey* (CTCYS; Hawkins, Catalano, & Arthur, 2002), the surveys posted on this site have demonstrated only limited evidence of validity and reliability and seldom is such evidence published in peer-reviewed journals.

Appendix A shows how subscales of the Delaware School Climate Survey compare to those on other popular measures of school climate. With the exception of items on the Delaware Bullying Victimization Scale (student and home versions), as explained latter (p. 17-19), all items are original.

Description of Surveys

As shown in Table I.1, the 2016 student survey includes five scales: *Delaware School Climate Scale* (DSCS), *Delaware Bullying Victimization Scale* (DBVS), *Delaware Student Engagement Scale* (DSES), *Delaware Positive, Punitive, and SEL Techniques Scale* (DTS), and the *Delaware Social and Emotional Competencies Scale* (DSECS). The home survey consists of three of the four scales (DSCS, DBVS, DSES), and the teacher/staff survey consists of two of the scales (DSCS, DTS).

For the *Delaware School Climate Scale*, five subscales, consisting of 31 total items, are found on each of the survey versions: teacher-student relationships, student-student relationships, clarity of expectations, fairness of rules, and school safety. A student engagement school-wide subscale (6 items) and bullying school-wide subscale (4 items) are also found on the student and teacher/staff versions. A teacher-home communications subscale (4 items) is found on both the teacher/staff and home versions, and a teacher-staff relations subscale (4 items) is found on the teacher/staff version. A total school climate score is derived for each of the three surveys by summing scores across all subscales. The home survey also assesses parent satisfaction (4 items), although these items are viewed as comprising a separate scale and do not contribute to the total school climate score.

The *Delaware Positive, Punitive, and SEL Techniques Scale* (DTS) is found on the student and teacher/staff surveys to assess perceptions of the extent to which three types of techniques are

used in the school to manage student behavior and promote self-discipline. The three subscales are: use of *positive behavior techniques* (5 items) (e.g., students being rewarded for good behavior), use of *punitive/corrective techniques* (5 items) (e.g., students being sent to the office), and *use of social emotional learning techniques* (6 items) (e.g., students being taught to feel responsible for their behavior).

The *Delaware Bullying Victimization Scale* (DBVS) found on the student and home surveys, assesses respondents' perceptions of bullying victimization experienced by the individual student. Students report their own experience of victimization, and parents/guardians are asked to report their child's victimization. The scale includes four subscales: *verbal bullying* (4 items), *physical bullying* (4 items), *social/relational bullying* (4 items), and *cyberbullying* (4 items). In Delaware, cyberbullying items appear only for grades 6-12. Two total scores are reported for the student version of the scale (DBVS-S): (1) the sum of the verbal, physical, and social/relational bullying subscales, and (2) the sum of the verbal, physical, social/relational, and cyberbullying subscales. However, because cyberbullying items do not appear on the home version (DBVS-H), that total score does not include cyberbullying.

Note: Item 13 on the DBVS-S, "I was bullied in this school" and on the DBVS-H, "My child was bullied in this school," is not included on any of the subscales or in the total scores. This item was designed to stand alone to examine if students and parents/guardians who report such bullying behaviors as teasing report "bullying" per se.

The *Delaware Student Engagement Scale* (DSES) is found only on the student and home versions. The scale includes three subscales: *cognitive engagement* (4 items), *behavioral engagement* (4 items), and *emotional engagement* (4 items). Summing scores across the three subscales derives a total score.

Finally, the *Delaware Social and Emotional Competencies Scale* (DSECS) is included on the student survey. Consisting of 12 items, this scale is designed to provide schools with a brief tool for assessing SEL skills, as perceived by students. Four domains of SEL skills – those more directly related to self-discipline and social relationships, are assessed: *self-management, responsible decision-making, relationship skills*, and *social awareness*. Only a total score is reported.

The surveys, as completed by respondents, and lists of items for each scale and subscale, are presented in Appendices B-H.

Table I.1		
Scales and Subscales of the 2016 Delaware School Surveys		
Student Survey	**Teacher/Staff Survey**	**Home Survey**
Delaware School Climate Scale		
Teacher-Student Relations	Teacher-Student Relations	Teacher-Student Relations
Student-Student Relations	Student-Student Relations	Student-Student Relations
Clarity of Expectations	Clarity of Expectations	Clarity of Expectations
Fairness of Rules	Fairness of Rules	Fairness of Rules
School Safety	School Safety	School Safety
Student Engagement-School-wide	Student Engagement-School-wide	
Bullying School-wide	Bullying School-wide	
	Teacher-Home Communications	Teacher-Home Communications
	Teacher-Staff Relations	
Total School Climate	Total School Climate	Total School Climate
		Parent Satisfaction
Delaware Positive, Punitive, and SEL Techniques Scale		
Positive Behavior Techniques	Positive Behavior Techniques	
Punitive Techniques	Punitive Techniques	
Social Emotional Learning Techniques	Social Emotional Learning Techniques	
Delaware Bullying Victimization Scale		
Physical Bullying[1]		Physical Bullying
Verbal Bullying[1]		Verbal Bullying
Social/Relational Bullying[1]		Social/Relational Bullying
Cyberbullying[2]		
Total Score (with and without Cyberbullying)		Total Score
Delaware Student Engagement Scale		
Cognitive		Cognitive
Behavioral		Behavioral
Emotional		Emotional
Total Score		Total Score
Delaware Social and Emotional Competencies Scale		
Total Score		

[1]Grades 6-12 only for the printed version. Optional for grades 4-5 with computer version.
[2]Grades 6-12 only.

School Climate: What Is It and Why It Should Be Assessed

Note: Much of the information in this section was taken from the following journal articles. Readers are referred to these publications for greater details about the development of the surveys, their theoretical support, and statistical results.

Mantz, L., Bear, G.G., Yang, C., & Harris, A. (2016). The Delaware Social-Emotional Competency Scale (DSECS-S): Evidence of validity and reliability. *Child Indicators Research*. Doi: 10.1007/s12187-016-9427-6

Bear, G.G., Yang, C., & Pasipanodya, E. (2014). Assessing school climate: Validation of a brief measure of the perceptions of parents. *Journal of Psychoeducational Assessment, 32*, 1-15.

Bear, G.,Yang, C., Pell, M., & Gaskins, C. (2014).Validation of a brief measure of teachers' perceptions of school climate: relations to student achievement and suspensions *Learning Environments Research*, *17*, 339-354.

Bear, G.G., Gaskins, C., Blank, J., & Chen, F.F. (2011). Delaware School Climate Survey—Student: Its factor structure, concurrent validity, and reliability. *Journal of School Psychology*, 49, 157–174.

What is School Climate?

Although a wide range of definitions of school climate exist, most refer to positive social relationships. For example, Haynes, Emmons, and Ben-Avie (1997) define 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). Recognizing the importance of interpersonal relationships and placing additional emphasis on safety, Cohen et al. (2009) recently 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).

Promoting a Positive School Climate as an Important Aim of School Initiatives

Recently, there has been increase interest in school climate among educators, educational policy makers, and researchers. This interest is seen in school climate becoming the focus of new government initiatives at the federal level (e.g., see http://safesupportiveschools.ed.gov/), including the recent awarding of School Climate Transformation Grants. Delaware was one of only twelve states to receive such an award (approximately $2.3 million for five years). A focus on school climate is also seen in the recently developed national school climate standards (Cohen, McCabe, Michelli, & Pickeral, 2009) and in the inclusion of the aim of improving school climate in school school-wide initiatives for preventing behavior problems and promoting mental health. These include universal-level prevention and promotion programs for social and emotional learning (Durlak, Domitrovich, Weissberg, & Gullotta, 2015; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Zins & Elias, 2006) and character education (Berkowitz & Schwartz, 2006), School-Wide Positive Behavior Supports (SWPBS) programs (Sailor, Dunlap, Sugai, & Horner, 2009), and universal programs that focus on preventing more specific behavior problems, such as bullying (Merrell, Gueldner, Ross, & Isava, 2008; Swearer,

Espelage, Vaillancourt, & Hymel, 2010) and school violence (American Psychological Association Zero Tolerance Task Force, 2008; Jimerson & Furlong, 2006). What many of these programs have in common is the aim of promoting a positive school climate.

Research Supporting the Importance of School Climate

Supporting the above initiatives, research has shown that school climate links to a wide range of academic, behavioral, and socio-emotional outcomes (Anderson, 1982; Haynes et al., 1997). Those outcomes include academic achievement (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Brand, Felner, Seitsinger, Burns, & Bolton, 2008); student academic, social, and personal attitudes and motives (Battistich, Solomon, Kim, Watson, & Schaps, 1995); attendance and school avoidance (Brand et al., 2003; Welsh, 2000); student delinquency (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Welsh, 2000); attitudes about and use of illegal substances (Brand et al., 2003); bullying victimization (Bandyopadhyay, Cornell, & Konold, 2009; Gottfredson et al., 2005; Welsh, 2000); depression and self-esteem (Brand et al., 2003; Way, Reddy, & Rhodes, 2007); and general behavior problems and suspensions (Battistich & Horn, 1997; Bear, Gaskins, Blank, & Chen, 2011; Kuperminc, Leadbeater, & Blatt, 2001; Welsh, 2000).

Shortcomings of Other Common Instruments for Assessing Program Effectiveness

Although a positive school climate is a goal of most school-wide programs for preventing behavior problems, school climate has seldom been evaluated in studies of program effectiveness. The most common method of evaluating the effectiveness of programs for preventing behavior problems in schools has been the use of teacher reports of student behavior (Wilson & Lipsey, 2007). Likewise, in studies of SWPBS, office disciplinary referrals (ODRs) have been the most common outcome measured (Horner & Sugai, 2007). Both teacher ratings and ODRs have their shortcomings.

A major shortcoming of teacher reports is reporter bias. That is, in rating student behavior, teachers in intervention schools often are well aware that the interventions they are implementing are expected to improve student behavior and that their negative ratings are likely to cast a negative light on their school's effectiveness and, in some cases, their own effectiveness. This bias may largely explain why intervention effect sizes tend to be larger when teacher reports, rather than student reports, are used in studies of program effectiveness (Wilson & Lipsey, 2007).

ODRs also have multiple shortcomings (Morrison, Redding, Fisher, & Peterson, 2006). Perhaps chief among them is that decreases in ODRs may occur without improvements in student behavior. Instead of improvement in behavior, reduced ODRs may simply reflect normal fluctuations in ODRs from year to year, and changes in referral policies and practices (Wright & Dusek, 1998). Unquestionably, both teacher ratings and ODRs have their advantages, especially when used as part of a multi-method system of assessing program needs and effectiveness (Irvin, Tobin, Sprague, Sugai, & Vincent, 2004; McIntosh, Frank, & Spaulding, 2010). However, in addition to the disadvantages noted above, they do not assess, nor are they intended to assess, school climate per se.

The *Delaware School Climate Scale* was created to help fill this void by providing schools with a brief, free, and psychometrically sound instrument for assessing student, teacher/staff, and parent/guardian perceptions of school climate. In developing this scale, a particular focus was creating a valid and reliable self-report tool that schools can use to assess (a) an integrated SWPBS and SEL approach to school discipline (Bear, Whitcomb, Elias, & Blank, 2015), as currently implemented in approximately 60% of schools in Delaware, and (b) bullying prevention programs, which are mandated by state law and thus implemented to one degree or another in all schools. These program initiatives include a focus on improving relations among students and between teachers and students, establishing clear and fair expectations and rules, increasing school safety, and reducing student conduct problems.

Theoretical Roots of the DSCS and Supporting Research

The development of the DSCS was guided by two theoretical frameworks: (a) authoritative discipline theory (Baumrind, 1971, 1996; Bear, 2005; Brophy, 1996; Gregory & Cornell, 2009) and (b) Stockard and Mayberry's (1992) theoretical framework of school climate, but particularly the former. Both are guided by social-ecological perspectives, as discussed below.

Authoritative Discipline

Supported by research on childrearing (Baumrind, 1971, 1996; Lamborn, Mounts, Steinberg, & Dornbush, 1991) and research on school discipline and school climate (Brophy, 1996; Gregory, Cornell, Fan, Shaeras, Shih, & Huang, 2010), authoritative discipline theory asserts that the most effective style of discipline, authoritative discipline, is comprised of a balance of two broad components. These two components are *responsiveness* and *demandingness* (Baumrind, 1996), which also are called *support* and *structure* (Gregory & Cornell, 2009; Gregory et al., 2010). Responsiveness, or social support, refers to the extent to which adults (and also peers) are responsive to children's social and emotional needs. Responsiveness is seen by others demonstrating warmth, acceptance, and caring. Demandingness, or structure, refers to the extent to which adults present clear behavioral expectations and fair rules, enforce those rules consistently and fairly, and provide necessary supervision and monitoring of student behavior. A healthy balance of responsiveness and demandingness fosters both willing compliance to rules and the social and emotional competencies that underlie self-discipline (Bear, 2010; Brophy, 1996). This combination also has been found to promote student perceptions of safety (Gregory et al., 2010) and liking of teachers and schools (Osterman, 2000).

Stockard and Mayberry's Framework

An emphasis on responsiveness and demandingness is also seen in Stockard and Mayberry's (1992) theoretical framework of school climate. They conducted a comprehensive review of the sociological, psychological, and economic theories and research of organizations, which included the effective schools and school climate literatures. Based on their review, they concluded that school climate is best conceptualized as consisting of two broad dimensions: social action and social order. Social action is similar to responsiveness, or social support, in authoritative discipline theory, with its emphasis on the 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 demandingness, or structure, with its primary goal being to curtail behavior problems and promote safety. Several studies by Griffith (1995, 1999) have supported Stockard and Mayberry's framework, showing that elementary school students' perceptions of social action and social order, and particularly the former, were related to their self-reports of academic performance and satisfaction.

Social-Ecological Perspective

Consistent with authoritative discipline theory, and Stockard and Mayberry's (1992) theoretical framework, the DSCS assumes a social–ecological perspective. As such, an individual's perceptions of the social environment (especially social transactions), rather than objective reality per se, are viewed as most important in understanding human behavior (Bandura, 1986, 1997; Bronfenbrenner, 1979).

A wealth of research and theory in psychology shows that how individuals *perceive* their environments is a strong predictor of important social, emotional, and academic outcomes – often stronger than what actually *occurs* in many environments. For example, a school that implements pervasive "zero tolerance" policies *may* have fewer discipline problems, and school staff (and some parents) may (or may not) view it as "safe." However, students may view it as overly harsh and lacking in positive attributes of fairness, warmth, caring, support, and respect. Indeed, student perceptions of school environments as being *fair* and *caring* have consistently been shown to be linked to fewer behavior problems, greater compliance with rules, higher achievement scores and grades, higher feelings of self-worth, lower drop-out rates, and the development of self-discipline (Arum, 2003; Bear, 2010; Pianta, 1999). These results tend to be strongest among African-Americans (Arum, 2003).

Research Supporting the Factors of the DSCS

Guided by authoritative discipline theory, the DSCS was designed to assess components of social support and structure consistent with the primary goals of SWPBIS, SEL, and bullying prevention programs.

As shown in the table below, three subscales assess responsiveness/social support: Teacher–Student Relations, Student–Student Relations, and Home-School Communication. Four subscales assess demandingness/structure: Fairness of Rules, Clarity of Expectations, School Safety, and Student Engagement. Participants respond on a 4-point Likert scale by indicating the degree to which they agree to a given statement. Response choices range from "Disagree a lot" to "Agree a lot."

Responsiveness/Social Support	Demandingness/Structure
Teacher-Student Relations	Clarity of Expectations
Student–Student Relations	Fairness of Rules
Teacher-Home Communication (*teacher/staff and home versions*)	School Safety
	Student Engagement-School-wide

Research Supporting Responsiveness/Social Support Subscales

Teacher-Student Relations. Students feel more comfortable and supported in schools and classrooms in which teachers are caring, respectful, and provide emotional support (e.g., Battistich, Solomon, Watson, & Schaps, 1997; Hughes, 2012; Osterman, 2000). In those environments, students experience greater school completion (Croninger & Lee, 2001), on-task behavior (Battistich et al., 1997), self-reported academic initiative (Danielsen, Wiium, Wilhelmsen, & Wold, 2010; Lee, 2012), academic achievement (Fredricks, Blumenfeld, & Paris, 2004; Gregory & Weinstein, 2004), peer acceptance (Hughes, Cavell, & Wilson, 2001; Gest & Rodkin, 2011; Kiuru et al., 2015; Mikami, Reuland, Griggs, & Jia, 2013), and motivation to act responsibly and prosocially (Wentzel, 1996; Luckner & Pianta, 2011; Mashburn et al., 2008). They also engage in less oppositional and antisocial behavior (Bru, Stephens, & Torsheim, 2002; Hamre, Pianta, Downer, & Mashburn, 2008; Jessor et al., 2003; Sabol & Pianta, 2012), including bullying (Gregory et al., 2010). Included on this subscale is one item more specific to respect for diversity.

Note: Previously, respect for diversity was a separate subscale on the DSCS (see statistical results in Chapter 2 on why respect for diversity items are now included on the student-student relationships and teacher-student relationships subscales).

Student-Student Relations. Students who are rejected by their peers are at increased risk for disruptive behavior, poor achievement (Danielsen, Wiium, Wilhelmsen, & Wold, 2010; Perdue, Manzeske, & Estell, 2009; Stewart, 2008), disliking of school, school avoidance, and not completing school (Buhs, Ladd, & Herald, 2006; Welsh, 2000; French & Conrad, 2001). Students who engage in negative peer interactions are more likely to show delinquent and aggressive behaviors (Demaray & Malecki, 2002) and more likely to report low self-esteem and depression (Brand et al., 2003; Carney, 2000; Demaray & Malecki, 2002; Parker & Asher, 1993; Spilt, van Lier, Leflot, Onghena, & Colpin, 2014). In contrast, social support from classmates has been shown to be related to academic initiative (Danielsen et al., 2010), to moderate victimization and distress for boys (Davidson & Demaray, 2007), and to predict externalizing and adaptive behaviors for girls (Reuger, Malecki, & Demaray, 2008).

Teacher-Home Communication (*teacher/staff and home surveys only*). A wealth of research studies show that parent involvement in their children's education is linked to a number of positive academic, social, emotional, and behavioral outcomes (Christenson, 2004; Christenson & Sheridan, 2001; Epstein & Van Voorhis, 2010). Research also shows that similar to students, parents prefer teachers who listen to and respect them (Griffith, 1996). Teacher communication with parents is important not only with respect to teacher likability, but also because research shows that lack of teacher-home communication is a common barrier to academic success of students (Griffin & Galassi, 2010). Fairly routine practices of teachers and schools can enhance parent involvement (Cox, 2005). Such practices include parent-teacher *collaboration* (e.g., teachers and parents working collaboratively via conferences and meetings to prevent and address student problems), but also more common and less time-consuming teacher-home *communication* (e.g., teachers sending notes home to parents, contacting and meeting with them, etc.). For example, in a review of the literature, Cox (2005) found that not only was two-way communication between school and home associated with positive student outcomes, but also

was one-way (school to home) communication. That is, strong effect sizes across grade levels were found in teacher use of school-to-home notes and daily reports, especially when such methods of communication focused on preventing or addressing specific child problems (Cox, 2005). Much weaker results of school-home interventions are reported when home-school interventions are implemented at the school-wide level, as opposed to the classroom level (Durlak, et al., 2011). Thus, items on this survey emphasize teachers communicating with parents.

Research Supporting Demandingness/Structure Subscales

Clarity of Behavioral Expectations. Clear behavioral expectations are emphasized in most approaches to classroom management and school discipline (Bear, 2005, 2014; Brophy, 1996; Doyle, 1986) and are a particular focus of the SWPBS approach (Sugai & Horner, 2009). Research shows that fair and consistent behavioral expectations and sanctions against misbehavior characterize the most effective schools (Arum, 2003; Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Gottfredson, Gottfredson, & Hybl, 1993; Gottfredson, Gottfredson, & Skroban, 1996).

Fairness of Rules. Perceived fairness of rules has been shown to relate significantly to greater student engagement and academic achievement and to less delinquent behavior, aggression, and student victimization (Arum, 2003; Brand et al., 2003; Gottfredson et al., 2005). Research also shows that students engage in less offending and misconduct when they perceive rules to be fair (Welsh, 2000, 2003). Multiple school climate surveys include a subscale designed to assess fairness of rules and clarity of expectations (e.g., Brand et al., 2003; Furlong et al., 2005; Gottfredson, 1999). Typically, fairness of rules and clarity of expectations are not distinguished and items measuring both constructs are combined. However, research, especially with students (e.g., Arum, 2003), indicates that it is important to distinguish the two; students often view rules and expectations to be quite clear, but not necessarily fair (e.g., "Students will be suspended for not completing homework.").

School Safety. Students and teachers perceive school climate more favorably when they feel safe (Kitsantas, Ware, & Martinez-Arias, 2004) and when aggression and victimization are not common (Astor, Benbenishty, Zeira, & Vinokur, 2002; Goldstein, Young, & Boyd, 2008). Students who perceive fewer safety problems at school tend to be more academically adjusted, engage in less delinquent and aggressive behaviors, and report greater self-esteem and fewer depressive symptoms (Brand et al., 2003; Horner et al., 2009). Whereas teacher–student relations are commonly found on student surveys of school climate, until recently (i.e., post-Columbine), school safety has not generally been included. When included, some surveys present items on school safety and student conduct problems together on the same subscale (e.g., Barnett, Easton, & Israel, 2002; Brand et al., 2003), whereas others (e.g., Center for Social and Emotional Education [CSEE], 2009; Emmons et al., 2002; Gottfredson, 1999) tend to include items surveying student perception of either school safety or student conduct problems, but not both. Originally, we developed items to tap both safety and conduct problems, expecting two distinct factors to emerge as found on the *California Safety and School Climate Survey* (Furlong et al., 2005). Our research (see Bear, Gaskins, Blank, & Chen, 2011) found two distinct factors, and indicated that conduct problems were not best represented as part of school climate, but

instead as a distinct construct. Thus, items tapping student conduct problems were not included on the current school climate scale.

Research Supporting Additional Subscales

Student Engagement School-wide. Cognitive, behavioral, and emotional engagement have been shown to be related to multiple student outcomes, including academic achievement, school completion, and social-emotional adjustment (Brand et al., 2008; Fredricks et al., 2004; Furlong et al., 2005). Items assess the cognitive, behavioral, and emotional dimensions of school engagement, as conceptualized by Fredericks et al, 2004. As such, they tap cognitive engagement, which entails motivation (e.g., "Most students do their best in school."); behavioral engagement, which entails academic learning and positive conduct ("Most students pay attention in class." "Most students follow the rules in school."); and emotional engagement (e.g., "I feel happy in school.").

Note. As with our *Bullying Victimization Scale* on the DSCS-S (student and teacher versions), student engagement is assessed at both school-wide and individual student levels (see pp. 19-20 for description of the *Delaware Student Engagement Scale*).

Bullying School-wide. Ample research has shown bullying to be related to multiple negative outcomes at both the individual student level and the school level (Swearer et al., 2010). Bullying is often conceptualized and measured as a separate construct from school climate, with studies showing that bullying is more prevalent in schools in which students perceive aspects of school climate to be poor, especially teacher-student support, student-student support, and disciplinary practices (Bandyopadhyay, et al., 2009; Gendron, Williams, & Guerra, 2011; Ma, 2002). However, recently, researchers have argued that bullying should be viewed as an aspect of school climate (Bandyopadhyay, et al., 2009). This makes sense in that bullying is part of student-student relationships. Because bullying might be perceived either of these two ways, the Delaware surveys include this subscale on the school climate survey for assessing school-wide bullying, but also a separate scale (the DBVS) for assessing bullying victimization at the individual student level.

Teacher-Staff Relations (*Teacher/Staff surveys*). This subscale, found only on the teacher version, was added in response to observations voiced by users (and by DDOE) that the relations between teachers and staff are part of school climate. This is commonly recognized in other teacher measures of school climate (Cohen, et al., 2009; Zullig, et al., 2010).

Delaware Positive, Punitive, and Social-Emotional Learning Techniques Scale (DTS) (*Student Teacher/Staff surveys*)

Found on the student and teacher/staff surveys (but not on the home survey), the *Delaware Positive, Punitive, and SEL Techniques Scale* (DTS) assesses respondents' perceptions of the use of positive, punitive, and social-emotional techniques within their school. Participants respond on a 4-point Likert scale by indicating the degree to which they agree with a given statement. Response choices range from "Disagree a lot" to "Agree a lot." A higher score on each subscale indicates greater use of that technique.

Positive Behavioral Techniques. This subscale consists of five items that assess the perceived use of two types of recognition of desired student behavior: the use of praise and rewards, as found commonly by the SWPBIS approach (Sugai & Horner, 2009) and in other approaches to school discipline. A common feature of the SWPBIS approach is the school-wide systematic acknowledgement and positive reinforcement of students for demonstrating appropriate behavior (Sugai & Horner, 2009). Multiple studies show that schools adopting the SWPBS approach tend to have fewer office disciplinary referrals, school suspensions, and expulsions (e.g., Bohanon et al., 2006; Horner et al., 2009; Luiselli, Putnam, & Sunderland, 2002; Mass-Galloway, Panyan, Smith, & Wessendorf, 2008; McCurdy, Mannella, & Eldridge, 2003; Metzler, Biglan, Rusby, & Sprague, 2001; Nelson, Martella, & Marchand-Martella, 2002).

In SWPBS schools, teachers and staff are expected to use such positive behavior techniques as tangible rewards (e.g., tokens, tickets), access to privileges or preferred activities, social recognition, and verbal praise as mechanisms for recognizing positive behaviors and "motivating students to use new skills" (George, Kincaid, & Pollard-Sage, 2009, p. 390). The systematic application of such techniques serves not only to reinforce desired behaviors, but also to increase the ratio of positive-to-negative interactions that staff have with students and subsequently foster teacher-student relations (McIntosh et al., 2010). The greater use of these techniques, particularly relative to the use of punitive techniques, has been shown to be associated with more positive student behavior (Alberto & Troutman, 2008).

Punitive Disciplinary Techniques. This subscale consists of five items that assess perceived use of harsh forms of punishment, including yelling and removing students from the classroom, that are associated with a *negative* school climate. This subscale does not include milder forms of punishment (with punishment defined as any techniques that reduces the future occurrence of a behavior) that *are* commonly and wisely used by the most effective classroom teachers and schools, in combination with positive behavioral techniques, to manage student behavior, such as taking away privileges, verbal reprimands, and physical proximity. Research clearly shows those techniques to be effective in managing student behavior (Alberto & Troutman, 2008; Landrum & Kauffman, 2006).

Instead of assessing the wise and strategic use of punishment, irrespective of its harshness (e.g., the judicious and fair use of suspension), the subscale is designed to assess the use of punitive techniques commonly found in a pervasive zero tolerance approach to school discipline (as opposed to an approach that would include reasonable zero tolerance policies; see Bear, 2005 & 2010 for a distinction between the two). The zero tolerance approach, including an emphasis on

use of the techniques included in this subscale, has been shown to be related to a negative school climate (APA Task Force on Zero Tolerance, 2008).

Social-Emotional Learning Techniques. Five items assess perceived use of social-emotional learning (SEL) techniques commonly associated with the Social and Emotional Learning approach to school discipline. Whereas the SWPBS approach is grounded in behaviorism and applied behavior analysis (Sugai & Horner, 2009), the SEL approach integrates a combination of theoretical perspectives, but primarily developmental theories that share the aim of building individual social-emotional, cognitive, and moral competencies (CASEL, 2005; Elias & Schwab, 2006). Like the SWPBS approach, the SEL approach targets social skills. However, whereas the SWPBIS approach focuses on changing student behavior by manipulating environmental antecedents and consequences in the environment, the SEL approach focuses much more on developing cognitions and emotions, especially those associated with a sense of responsibility, emotional and behavioral regulation, emotional competence, perspective taking, empathy, and social problem solving (Elias & Schwab, 2006).

SEL is strongly supported by research (Bear, 2010; Durlak et al., 2011; Durlak, Domitrovich, Weissberg, & Gullotta, 2015; Elias & Schwab, 2006; Cohen & Geier, 2010). For example, in a recent meta-analysis of SEL programs in grades K-12, Durlak et al. (2011) found SEL techniques to be associated with positive changes in attitudes towards self and others, improved school climate, increased academic achievement, increased prosocial behavior, decreased conduct problems, improvements in emotional functioning, and pronounced developments in social-emotional competencies.

Delaware Bullying Victimization Scale (DBVS) (*Student and Home surveys*)

The *Delaware Bullying Victimization Scale* consists of four subscales: Physical Bullying (4 items), Verbal Bullying (4 items), Social/Relational Bullying (4 items), and Cyberbullying (4 items). As previously noted, this scale is only on the student and home surveys, and the home version does not include the cyberbullying items.

Bullying victimization items are not included on the Scantron version for grades 3-5. This is because many of the items are too difficult for third graders to read. Elementary schools do have the option, however, of having students in grades 4 and 5 complete the verbal, physical, and social/relational subscales through the online format (Skip Logic is used on the computerized version such that students entering grade 3 are not given the bullying items, and students in grades 3-5 are not given cyberbullying items).

Note: Items on the *Bullying Victimization Scale* differ from those on the School-wide Bullying subscale of the DSCS in that they focus on the individual student's victimization (or the victimization of the parent's child for the Home version) and not that of the school as a whole. For example, items on the Student survey for this scale include:

- A student said mean things to me. (Verbal)
- I was pushed or shoved on purpose. (Physical)
- A student told/got others to not like me. (Social/Relational)

A separate score is computed for each subscale (Verbal, Physical, Social/Relational, and Cyberbullying) and a total Bullying in School score is computed by summing the scores on the three (or four) subscales. That is, two separate total scores are calculated. For grades 3-5, the total score consists of the sum of scores on the verbal, physical, and social/relational subscales, as students in those grades do not complete the cyberbullying subscale. For higher grades, a total score is calculated for those three subscales, but an additional total score is also computed that includes cyberbullying. Computing a total score without cyberbullying allows schools to compare total scores across grade levels while using the three subscales in common. Providing two different total scores is consistent with a current debate among researchers over whether or not cyberbullying should be viewed as the same construct as the other three forms of bullying, especially since it most often occurs outside of the school (e.g., Olweus, 2012).

Students respond on a 6-point Likert scale by indicating the degree to which he or she has been a victim of the given bullying behavior "during this school year." Response choices range from "Never" to "Every day."

Note: Items for the verbal, physical, and social/relational subscales were adapted from the *Adolescent Peer Relations Instrument: Bully/Target* (Marsh et al., 2011; Parada, 2000), which consists of both a bullying and a victimization scale. We used only the latter scale.

Supporting Research

Bullying refers to intentional actions, repeated over time, that harm, intimidate, or humiliate another person (the victim) and that occur within the context of an imbalance of power, either real or perceived, between the bully and the victim (Marsh et al., 2011; Olweus, 1997; Swearer, Espelage, Vaillancourt, & Hymel, 2010). Researchers have identified and focused primarily on three forms of bullying: physical (e.g., hitting pushing), verbal (e.g., name calling, threatening, slandering), and social/relational (e.g., excluding or isolating others). A fourth form of bullying, cyberbullying, has recently received attention, although little research exists on it. Each of these four forms of bullying is assessed by the *Delaware Bullying Victimization Scale* of the student survey.

Multiple negative outcomes are associated with bullying, at both the individual student level and the school level (Swearer et al., 2010). Victims of bullying are at-risk for anxiety, stress, depression and loneliness (Faris & Felmlee, 2014; Juvonen, Graham, & Schuster, 2003; Nansel et al., 2001; Smokowski & Kopasz, 2005; Bradshaw, Waasdorp, & O'Brennan, 2013; Goldweber, Waasdorp, & Bradshaw, 2013; Rueger & Jenkins, 2013; Duarte, Pinto-Gouveia, & Rodrigues, 2015), suicidal ideation, suicide attempts, and self-injury (Bannink, Broeren, van de Looij-Jansen, de Waart, & Raat, 2014; Claes, Luyckx, Baetens, Van de Ven, & Witteman, 2015), distrust of peers, fear/avoidance of school (Hutzell & Payne, 2012; Smokowski & Kopasz, 2005), and lower academic engagement and achievement (Buhs, Ladd, Herald-Brown, 2010; Boulton et al., 2012; Smokowski & Kopasz, 2005; Rueger & Jenkins, 2013). Bullies themselves often experience more negative outcomes in life than do non-bullies, including conduct problems, poor academic achievement (Smokowski & Kopasz, 2005; Bradshaw,Waasdorp, Goldweber, & Johnson, 2013), anxiety and depression (Seals & Young, 2003), delinquency, substance abuse, and criminality (Olweus, 2003; Pepler, 2006; Smokowski & Kopasz, 2005;

Ttofi, Farrington, Losel, & Loeber, 2011; Bradshaw, et al, 2013). Bullying also is related to school climate, with studies showing that bullying is more prevalent in schools in which students perceive aspects of school climate to be poor, especially teacher-student support (Boulton et al., 2012; Gage, Prykanowski, & Larson, 2014; Demaray & Malecki, 2003; Richard, Schneider, & Mallet, 2011; Thomas, Bierman, & Powers, 2011; Elledge, Elledge, Newgen, & Cavell, 2015), student-student support (Elsaesser, Gorman-Smith, & Henry, 2013; Gage, Prykanowski, & Larson, 2014; Henry, Farrell, Schoeny, Tolan, & Dymnicki, 2011), and disciplinary practices (Bandyopadhyay, Dewey, & Konold, 2009; Ferrans & Selman, 2014; Klein, Cornell, & Konold, 2012; Cornell, Shukla, & Konold, 2015).

With respect to our adaptation of the *Adolescent Peer Relations Instrument: Bully/Target* (Marsh et al., 2011; Parada, 2000), in a large study of students in grades 7-12 conducted by Marsh and colleagues (2011), the factor structure of the scale was strongly supported with confirmatory factor analysis. Scores were shown to relate in the predicted fashion with several variables, including depression (i.e., among both bullies and victims, bullying correlated with depression, especially social/relational and verbal bullying) and self-concept (i.e., both bullies and victims tended to have more negative self-concepts). Boys were found to score higher than girls (both as bullies and as victims) on the physical and verbal subscales, but not on the social-relational subscale. Scores also were found to increase from grades 7 to 8 and to level off thereafter, but with a gradual decline in victimization in grades 10 and 11. One intriguing and unexpected finding (which supports an emphasis on teaching SEL skills) was that bullying and victimization were associated with high scores on external locus of control (e.g., viewing others as controlling their behavior) and low scores on internal locus of control (e.g., viewing one's own actions and efforts as determining their behavior).

Delaware Student Engagement Scale (DSES)
(*Student and Home surveys*)

The student and home surveys also include the *Delaware Student Engagement Scale* (DSES), consisting of 12 items measuring student self-reported engagement. This scale consists of three subscales, as described below: cognitive engagement, behavioral engagement, and emotional engagement. Summing the three subscale scores derives a total score. Participants respond on a 4-point Likert scale by indicating the degree to which they agree to a given statement. Response choices range from "Disagree a lot" to "Agree a lot."

It is important to note that items on the scale differ from those on the Student Engagement School-wide subscale of the DSCS in that they focus on the *individual* student's engagement, not engagement of students, in general, across the school. That is, instead of responding "In this school," as done on the school climate scale items, each item stem begins with "I." For example:

- I try my best in school. (Cognitive Engagement)
- I stay out of trouble at school. (Behavioral Engagement)
- I feel happy in school. (Emotional Engagement)

Student engagement refers to students being involved, committed, or invested in aspects of schooling. Student engagement is related to multiple student outcomes, including academic achievement, school completion, and school suspensions (Fredricks et al., 2004). This includes

each of the three aspects of student engagement. For example, emotional engagement correlates with less delinquency, alcohol and substance use, violence, suicidality, and emotional stress (Fredericks et al., 2004; Resnick et al., 1997), school completion (Cairns & Cairns, 1994; Finn, 1989) and with higher levels of academic achievement (Ding & Hall, 2007; Thompson, Iachan, Overpeck, Ross, & Gross, 2006).

Three types of school engagement are commonly recognized by researchers (Fredricks et al., 2004): cognitive, behavioral, and emotional.

Cognitive engagement entails motivation, effort focused on learning (not just on doing the work, but doing it well and to learn), and psychological investment in learning. When cognitively engaged, students exert their best effort and do well academically.

Behavioral engagement entails both academic learning and positive conduct. Students are engaged behaviorally when they are paying attention, following school rules, and not getting into trouble. Some researchers also include school-related activities such as extracurricular activities, sports, and student governance when measuring behavioral engagement. Although we recognize the importance of this aspect of behavioral engagement, it is not included on the Delaware student survey because the survey is designed for grades 3 through 12, and engagement in such school-related activities is uncommon in elementary schools.

Emotional engagement entails how students feel about their classrooms and school, and includes attitudes toward school and liking or disliking of school. Whereas some studies have treated emotional engagement or liking of school as a distinct construct measured by a scale separate from school climate (e.g., Child Development Project, 1993; Ladd & Price, 1987), others have included it as one of several components of the school climate or environment (e.g., Ding & Hall, 2007) or included one or two items tapping emotional engagement or liking of school as part of an overall measure of school climate (e.g., Barnett et al., 2002; California Department of Education, 2009).

Delaware Social and Emotional Competencies Scale (DSECS)
(Student Survey only)

The *Delaware Social and Emotional Competencies Scale* (DSECS) consists of 12 items, completed by students in grades 3-12. With an emphasis on assessing self-discipline and social relationships, the scale is designed to assess four of five social-emotional competencies: *responsible decision-making, relationship skills, self-management,* and *social awareness*. These competencies are identified by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2012), the leading authority in the field of social-emotional learning (SEL), as the general social-emotional competencies that schools should develop in students following the SEL approach to school discipline and mental health. For reasons discussed later, the social-emotional competency of *self-awareness* is not included in the DSECS. Self-awareness refers to skills in identifying one's own emotions and thoughts, understanding how thoughts and emotions impact one's behavior, and assessing personal strengths and weaknesses (CASEL, 2012; Zins & Elias, 2006).

A total score on the DE-SECS is reported, consisting of the sum of scores across twelve items. Students respond to each item using a 4-point Likert scale, with 4 = *Very much like me*, 3 = *Somewhat like me*, 2 = *Not much like me*, and 1 = *Not like me at all*.

Social-Emotional Competencies Assessed

The importance of each of the four competencies included in the DSECS and research supporting each one are reviewed below.

Responsible decision-making. Responsible decision-making refers to the ability to make safe, respectful, and ethical decisions about one's behavior, relationships, and interactions with others (CASEL, 2012). This includes social problem solving and moral reasoning skills; making decisions that not only solve problems related to social interactions, but that are based on consideration of the needs of others and not just oneself. Students with stronger responsible decision-making skills typically demonstrate greater empathy and sympathy (Eisenberg-Berg & Mussen, 1978; Eisenberg et al., 2001), greater prosocial behavior (Eisenberg, Fabes, & Spinrad, 2006; Ongley, Nola, & Malti, 2014; Schonert-Reichl, 1999), and stronger perspective-taking skills (Eisenberg et al., 2001). Relatedly, they also tend to demonstrate greater competence in peer interactions (Pettit, Dodge, & Brown, 1988), which may explain why they typically have more friends (Schonert-Reichl, 1999) and are more popular among peers (Asarnow & Callan, 1985; Newcomb et al., 1993; Pakaslahti, Karjalainen, & Keltikangas-Jarvinen, 2002).

Relationship skills. Relationship skills refer to the ability to form and maintain healthy friendships, listen to others, work cooperatively, handle conflict constructively, and assist others (CASEL, 2012). Studies examining relationship skills often use instruments that combine relationship skills with other social-emotional competencies, such as social awareness skills or self-management. Nevertheless, these studies suggest that students with stronger relationship skills are more popular, accepted by peers, and have more reciprocated friendships compared to students with weaker relationship skills (Kwon, Kim, & Sheridan, 2012; Newcomb, Bukowski, & Pattee, 1993). Students with stronger skills in this area also tend to like school more, demonstrate greater school engagement, and display greater academic behaviors (Kwon et al., 2012).

Self-management. Self-management refers to skills in effectively regulating one's thoughts, emotions, and behaviors (CASEL, 2012). Greater skills in this area are associated with fewer behavior problems (Graziano, Reavis, Keane, & Calkins, 2007), higher self-esteem (Tangney, Baumeister, & Boone, 2004), less psychopathology (Tangney et al., 2004), and less cigarette, alcohol, and drug abuse later in life (Romer et al., 2010; Tangney et al., 2004). Students with greater self-management skills tend to exhibit greater interpersonal skills (Tangney et al., 2004) and stronger relationships (Tangney et al., 2004); including the relationships they have with their teachers (Graziano et al., 2007). Self-management skills also are positively associated with academic achievement and competence (Blair & Razza, 2007; Duckworth, Tsukayama, & Kirby, 2013; Tangney et al., 2004).

Social awareness. Social awareness refers to individuals' ability to understand others' behavior, take others' perspectives, and demonstrate empathy (CASEL, 2012). Stronger skills in

this area are associated with less aggression and externalizing behaviors (Findlay, Girardi, & Coplan, 2006; Fitzgerald & White, 2003; Hastings et al., 2000; Li et al., 2015; Strayer & Roberts, 2004) and greater prosocial behavior (Cigala, Mori, & Fangareggi, 2014; Eisenberg et al., 1999; Fitzgerald & White, 2003).

We view these four competencies as aligning most closely with self-discipline and positive relationships. Self-discipline refers to students making responsible decisions (and accepting responsibility for their behaviors). It entails regulating one's behavior, while understanding and appreciating the impact of one's behavior on others, exhibiting prosocial behavior toward others, and inhibiting anti-social behavior. These skills are critical for establishing and maintaining positive relationships. Self-discipline reflects intrinsic rather than extrinsic motivation; students recognizing that although rewards and punishment may influence decision-making and behavior, one acts prosocially even when rewards or the threat of punishment is not salient (Bear, 2010). In sum, self-discipline entails self-management, responsible decision making, social awareness, and relationship skills, and it is critical to positive relationships.

Rationale for Excluding Self-Awareness

In emphasizing self-discipline and positive relationships, items on the DSECS were designed to assess four of CASEL's social and emotional competencies, excluding the self-awareness domain. Other than emphasizing self-discipline and relationships, the decision not to include items assessing self-awareness was made for several reasons. First, because self-awareness includes students recognizing their emotions and assessing their limitations, we questioned the appropriateness of schools surveying students' feelings of self-esteem, depression, and overall emotional well-being. To do so would require a higher level of parent approval for completion of the surveys (i.e., active consent), which would likely result in fewer completed surveys. More importantly, however, it also would raise ethical issues, including whether individual students should be identified (e.g., those responding they are depressed) and be provided mental health services (especially when those services are not available in the schools). We do not dismiss the importance of schools using other screening surveys for this purpose, but screening for emotional problems was not a purpose of the *Delaware School Surveys*.

Second, we questioned the value of adding items that assess self-esteem, which often is included under self-awareness. This is in light of research showing that general self-esteem is seldom consistently found to be related to valued academic and social outcomes (other than depression) and that programs that target improving self-esteem rarely improve those outcomes (Manning, Bear, & Minke, 2006). This would include research showing that many bullies are not lacking in self-esteem (Rigby & Slee, 1991; Seals & Young, 2003).

Third, with respect to recognizing or identifying emotions, we found that self-awareness is typically included in State SEL standards in preschool and early elementary school, and not afterwards. The *Delaware School Surveys* begin in third grade and use the same items across all grade levels (thus, we thought it would not be very useful to ask high school students if they recognize or are aware of anger, joy, and other emotions).

It also is our view that important social emotional competencies most related to self-awareness and self-discipline are reflected in other items on the other four subscales of the DSECS, as well as on the *Delaware Student Engagement Scale*. This is particularly true with self-efficacy, which we view as an important social emotional skill related to self-discipline that is supported by research (Bandura, 1997; Quiggle, Garber, Panak, & Dodge, 1992; Zimmerman, 2002; Zimmerman & Kitsantas, 2014). Self-efficacy, or self-confidence, is captured in multiple items on the other four DSECS subscales, including: *I am good at solving conflicts with others; I am good at waiting for what I want; I am good at deciding right from wrong.*

Our decision not to have items specific to self-awareness is supported by other researchers collapsing the five general social emotional competencies into fewer ones while excluding self-awareness. This is seen in the State SEL standards for Illinois and Pennsylvania, which target three general social emotional competencies, or domains: (1) self-awareness and self-management (2) social-awareness and interpersonal relationships, and (3) decision-making skill and responsible behavior. Close examination of standards for the self-awareness and self-management domains reveals that most standards for self-awareness appear for preschool and early elementary. For example, recognizing and identifying emotions are skills that children are generally expected to develop before or during early elementary.

Finally, our decision to exclude the emotional awareness domain is supported in other national standards that focus more on learning for school-age children and adolescents. As reported by Dusenbury et al. (2015), this is seen in the National Research Council (NRC) recognizing three sets of competencies deemed essential for success in education and work: intrapersonal, interpersonal, and cognitive skills. Whereas intrapersonal skills align most closely with the self-management domain under the CASEL SEL standards, interpersonal skills aligned with the relationships and social awareness domains, and cognitive skills align with the responsible decision making domain. The emotional domain, including self-concept and recognizing emotions, is more often found in standards for preschool, as seen in the SEL Head Start Framework, and is the one domain most likely to found to be absent in other sets of national standards, including Common Core State Standards (Dusenbury et al., 2015).

Validity Screening Items

The survey also contains two validity screening items found only on the Student survey. One of these items ("I am telling the truth in this survey") is the final item on the DSCS. The other item ("I answered all items truthfully on this survey") is the final item on the Delaware Student Engagement Scale. These items were added to ensure that students responding to the survey were providing accurate and honest answers.

Students are only considered to be valid respondents if they select "agree" or "agree a lot" to *both* of these items. If they respond "disagree" or "disagree a lot" to either or both items, they are considered an invalid respondent. If they do not respond to either item or respond to only one item (but select "agree" or "agree a lot" to that item), their entire survey is considered invalid.

Previous research has suggested that inaccurate respondents comprise approximately 8% of survey takers (Cornell, Klein, Konold, & Huang, 2012). For the 2013 Student DE School Survey, 6.9% of responses were considered invalid and 4.6% were considered incomplete (Mantz, Bear, & Glutting, 2014). Only valid responses were used in all analyses reported in this manual.

CHAPTER 2
VALIDITY AND RELIABILITY OF DELAWARE SCHOOL SURVEY SCALES–STUDENT VERSION

The student version of the Delaware School Survey consists of five scales: *Delaware School Climate Scale –Student (DSCS−S), Delaware Positive, Punitive, and SEL Techniques Scale – Student* (DTS−S), the *Delaware Bullying Victimization Scale – Student* (DBVS−S), the *Delaware Student Engagement Scale – Student* (DSES−S), and the *Delaware Social and Emotional Competencies Scale* (DSECS). In this chapter we present evidence of the validity and reliability of scores on each of those scales.

The development of the DSCS−S and evidence of validity and reliability of scores on an earlier version of the scale are presented in a research article by Bear, Gaskins, Blank, and Chen entitled "Delaware School Climate Survey–Student: Its Factor Structure, Concurrent Validity, and Reliability" which appeared in the *Journal of School Psychology* (Volume *49*, 2011). That study was conducted on the 2007 version of the survey. Confirmatory factor analyses were performed on a sample of 11,780 students in 85 schools, with results showing that a bifactor model consisting of five specific factors and one general factor (School Climate) best represented the data. Those factors were represented in five subscales: Teacher–Student Relations, Student–Student Relations, Fairness of Rules, Liking of School, and School Safety. The factor structure was shown to be stable across grade levels (i.e., elementary, middle, and high school), racial–ethnic groups (i.e., Caucasian, African American, and Hispanic), and gender. As evidence of the survey's concurrent validity, scores for each of the five subscales and the total scale correlated moderately, across groups and at the school level, with academic achievement and suspensions and expulsions. Since then the DSCS-S has been revised. Version 1 of the *DSCS Technical Manual* (2012-2013) documented the evidence of the 2011 surveys, whereas Version 2 (2014) documented the evidence of the 2013 surveys.

Unlike the 2007 and 2013 versions, the 2016 revised DSCS-S consists of seven subscales. Five of these subscales mirror the Teacher/Staff and Home versions: Teacher–Student Relations (5 items), Student–Student Relations (5 items), Clarity of Expectations (4 items), Fairness of Rules (4 items), and School Safety (3 items). Additionally, 6 items assess Student Engagement School-wide and 4 items assess Bullying School-wide (also found on the Teacher/Staff Versions). One item assesses the validity of students' responses ("I am telling the truth in this survey."), and thus is not included on any subscale (note that the second validity item appears later in the survey and on a different scale).

Results of validity and reliability studies of the school climate scale, and the additional four scales of the survey are reported below. All analyses are based on the 2015 administration of the survey during which we field-tested new items.

Participants

The original 2015 sample consisted of 38,661 students in elementary, middle, and high schools. After deleting students with invalid responses (based on the two validity items, as noted previously in Chapter 1) and those who did not complete demographic information, the final sample, as used in statistical analyses that follow, included 24,414 students from 126 public elementary, middle, and high schools. The sample represented 61% of public elementary, middle, and high schools in the state, and consisted of 38% of the state's total public school population of 101,434 students in grades 3-12. Schools volunteered to participate upon request from the DDOE. Several charter schools were included that served the general population (i.e., not special education or alternative schools). Schools were given the option of having students complete the survey via an online Qualtrics version or printed Scantron form. Among the students in the original sample, 32,414 used the online version and 4,338 used the printed Scantron version.

Table II.1 provides student demographic information for the sample as obtained from the surveys, as well as the percentage of students in each category statewide as reported by the DDOE. As seen in the table, the demographics for the final sample closely approximated those for the state. However, the percentage of African American respondents was lower in our sample compared to the state, and the percentage of Multi-Racial respondents was higher compared to the state.

Table II.1

Demographic Information for the Student Sample

	Grade Level				
	Elementary (79 schools)	Middle (28 schools)	High (19 schools)	Full Sample (126 schools)	Statewide
Gender					
Boys	7,478 (49.5%)	5,308 (49.1%)	3,161 (48.5%)	15,947 (49.2%)	Not Reported
Girls	7,618 (50.5%)	5,497 (50.9%)	3,352 (51.5%)	16,467 (50.8%)	
Race/ Ethnicity					
White	7,018 (46.5%)	5,039 (46.6%)	3,166 (48.6%)	15,223 (47.0%)	46.0%
Black	3,909 (25.9%)	2,756 (25.5%)	1,784 (27.4%)	8,449 (26.1%)	30.7%
Hispanic/ Latino	2,005 (13.3%)	1,444 (13.4%)	729 (11.2%)	4,178 (12.9%)	16.0%
Asian	557 (3.7%)	365 (3.4%)	276 (4.2%)	1,198 (3.7%)	3.7%
Multi-Racial/Other	1607 (10.6%)	1201 (11.1%)	558 (8.6%)	3,366 (10.4%)	3.7%
Total N	15,096	10,805	6,513	32,414	

Confirmatory Factor Analyses

Confirmatory factor analysis (CFA) was the primary statistical procedure used to verify the factor structure of each of the scales on the surveys —to test if the items on each scale represented the hypothesized structure of the scale, and did so across subgroups of students (i.e., boys and girls, racial/ethnic groups, grade levels).

Mplus 7.31 (Muthén & Muthén, 1998-2015) was used for conducting the CFA. Missing data analysis was performed using the full information maximum likelihood (FIML) estimator in Mplus. FIML is a recommended procedure for estimating parameters with incomplete data. Because students were nested within schools, intraclass correlations (ICCs) were calculated for each of the factor scores to assess the degree to which variability in student responses could be accounted for at a school level. The ICCs on the subscale factor scores of DSCS-S in the full sample ranged from .04 (Clarity of School Rules) to .10 (Safety) and the ICC of the total in the full sample was .09. Because the ICCs indicated that student responses were non-independent and a portion of the variance was accounted for at the school level, CFA accounted for the nesting of students within schools, and individual item responses were centered on the school mean by utilizing the centering command in Mplus. Group mean centering addressed the clustering issue by removing the school mean differences from the item responses, thereby producing ICCs of zero for each item.

Based on preliminary results of exploratory CFA, two items predicted to load on the Respect for Diversity factor were moved to other subscales. This included one item that appeared on the previous version of the DSCS-S (# 2. *Teachers treat students of all races with respect*), which was found to best load on the Teacher-Student Relationships factor, and a new item that was field-tested (*#21. Students respect others who are different*) and loaded best on the Student-Student Relationships factor. The following three additional items on the hypothesized Respect for Diversity factor were deleted from further analyses due to poor loadings:

#12. Adults care about students of all races. (item on previous version of the DSCS-S)
#26. Students of different races get along. (new item field-tested in 2015)
#27. Teachers expect the best from students of all races. (new item field-tested in 2015)

Following the exploratory CFA, we first tested a second-order model with one higher-order factor and seven lower-order factors. In addition, we estimated a one-factor model, a bifactor model, and a seven-factor model with each item specified as an indicator of a factor corresponding to the assigned subscale. Chi-square difference tests were calculated using the Satorra–Bentler scaled chi-square difference test (Asparouhov & Muthén, 2010) to compare the hypothesized model with alternative models. Given that chi-square fit statistics are sensitive to sample size and violation of normality assumption, three other commonly used fit indices were also employed to assess model fit: the Comparative Fit Index (CFI), the Root Mean-Square Error of Approximation (RMSEA), and the Standardized Root Mean-Square Residual (SRMR). Generally, CFI values close to or greater than .95. SRMR values close to or less than .08, and RMSEA values close to or less than .06 reflect adequate fit (Hu & Bentler, 1998). When used in combination, instead of independently, these indices provide a more conservative and reliable evaluation of model fit (Brown, 2015).

For cross-validation purposes, the sample was randomly divided into two subsamples. The first sample was used to examine model fit for the hypothesized model and the three alternative models. The second sample was used to verify and replicate the final model derived from the first sample.

In order to investigate whether the surveys were of comparable factor structure across different groups of respondents (i.e., elementary, middle, and high school students; racial–ethnic groups; and boys and girls), measurement invariance was tested in a hierarchical sequence with increasingly restrictive steps to investigate whether the factor structure of the final model was statistically equivalent across gender. Five steps were followed, as suggested by Chen and colleagues (Chen, Sousa, & West, 2005): (a) configural invariance (Model 1); (b) first-order factor loading invariance (Model 2); (c) first- and second-order factor loading invariance (Model 3); (d) first- and second-order factor loading and intercepts of measured variables invariance (Model 4); and (e) first- and second-order factor loadings, and intercepts of measured variables and first-order factors invariance (Model 5).

Configural invariance examined if the same items were indicators of the same latent factor. In testing for configural invariance in Model 1, the same parameters in the second-order model were estimated across male and female groups, but different estimates were allowed for the corresponding parameters in the different groups. The fit of configural invariance models also provided the baseline value against which all subsequently specified invariance models were compared (Byrne, 2006). In testing for first-order factorial invariance in Model 2, all of the first-order factor loadings were constrained to be equal across groups. This level of invariance was nested within Model 1. In testing for first- and second-order factorial invariance in Model 3, all first- and second-order factor loadings were constrained to be equal across groups. This form of invariance is nested within Model 2. Models 4 and 5 impose additional constraints to determine whether two different sets of intercepts are invariant in Model 4, the focus is on the measured variables. In addition to the constraints already imposed on the first- and second-order factor loadings in Model 3, the intercepts of the measured variables were constrained to be equal across groups. This condition is required to detect potential differences in the intercepts of the measured variables between groups when only the first-order factors are involved. In a second-order factor model, the intercepts of the first-order latent factors must also be invariant across groups in addition to intercept invariance of measured variables to compare the second-order factor means across groups. In testing for this level of invariance in Model 5, first- and second-order factor loadings and the intercepts of the measured variables and first-order latent factors were constrained to be equal across groups.

Each pair of models in the sequence is nested because a set of parameters are constrained to be equal across groups in the more restricted model. To compare the fit for two nested models, the Satorra–Bentler scaled chi-square difference (Asparouhow & Muthén, 2010) and the goodness-of-fit indexes (Cheung & Rensvold, 2002) were used. However, because the chi-square difference test is affected by non-normality and large sample size, in testing measurement invariance we followed the recommendation by Cheung and Rensvold (2002) and considered a difference of larger than .01 in the change of CFI as an indication of a meaningful change in model fit.

Results of Confirmatory Factor Analyses

Comparing seven-factor model with alternative models. As shown in Table II.2, the hypothesized second-order model yielded adequate fit indices, and the seven-factor correlation model and bifactor model also achieved adequate model fit. Because the second-order model is more consistent with the theoretical framework of school climate construct, it was chosen as the final model.

Table II.2

Fit Statistics for Seven-factor Models Tested (DSCS-S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	37,386.96*	434	.685	.076	.072
Seven-factor model	6,171.04*	413	.951	.030	.030
Second-order model	9,278.37*	427	.925	.047	.036
Bifactor model	7,751.53*	403	.937	.042	.034

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s = 16, 207. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly selected half of the sample also generated robust fit statistics for the second-order model: $\chi^2 = 9{,}347.51$ (427, $N = 16{,}207$), $p < .001$; CFI = .925, RMSEA = .036, and SRMR = .047. Completely standardized factor loadings were also compared to ensure that there were no large differences between the randomly split samples. As illustrated in Table II.3, indicators demonstrated similar factor loadings on the higher-order factors and seven lower-order factors in both halves of the sample. As no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the second-order model with full sample and subsamples is presented in Table II.4.

Table II.3						
Confirmatory Factor Analysis of Second-order Model (DSCS-S)						
	Sample 1			Sample 2		
Factor and Items	Loading	*SE*	*z*	Loading	*SE*	*z*
Second-Order Factor: School Climate						
Teacher-Student Relations	0.78	0.01	98.22	0.77	0.01	101.64
Student-Student Relations	0.81	0.01	93.67	0.82	0.01	105.26
Clarity of Expectations	0.72	0.01	64.14	0.72	0.01	67.31
Fairness of Rules	0.75	0.01	66.06	0.75	0.01	67.46
Safety	0.82	0.01	113.63	0.82	0.01	123.68
School-wide Bullying	0.39	0.01	32.98	0.40	0.01	35.40
School-wide Engagement	0.87	0.01	140.34	0.88	0.01	151.28
Teacher-Student Relations						
2. Teachers treat students of all races with respect.	0.60	0.01	51.52	0.60	0.01	48.02
7. Teachers care about their students.	0.75	0.01	99.28	0.75	0.01	93.98
17. Teachers listen to students when they have problems.	0.69	0.01	93.76	0.69	0.01	104.79
22. Adults who work here care about the students.	0.77	0.01	87.40	0.79	0.01	106.38
32. Teachers like their students.	0.74	0.01	111.55	0.75	0.01	114.28
Student-Student Relations						
11. Students are friendly with each other.	0.73	0.01	125.77	0.72	0.01	112.51
16. Students care about each other.	0.73	0.01	134.87	0.72	0.01	129.81
21. Students respect others who are different	0.66	0.01	86.97	0.68	0.01	97.71
30. Students treat each other with respect.	0.78	0.01	130.34	0.78	0.01	143.66
31. Students get along with each other.	0.75	0.01	116.84	0.76	0.01	127.13
Clarity of Expectations						
5. Rules are made clear to students.	0.59	0.01	62.63	0.59	0.01	61.45
10. Students know how they are expected to act.	0.65	0.01	87.12	0.64	0.01	75.86
15. Students know what the rules are.	0.70	0.01	89.21	0.69	0.01	78.57

20. It is clear how students are expected to act.	0.71	0.01	73.19	0.71	0.01	81.06
Fairness of Rules						
3. The school rules are fair.	0.72	0.01	93.00	0.71	0.01	90.17
8. The consequences of breaking rules are fair.	0.55	0.02	34.17	0.55	0.02	30.90
18. The school's Code of Conduct is fair.	0.71	0.01	75.20	0.71	0.01	71.01
28. Classroom rules are fair.	0.72	0.01	99.48	0.74	0.01	104.25
Safety						
4. Students are safe in the hallways.	0.56	0.01	49.41	0.56	0.01	46.58
13. Students feel safe.	0.79	0.01	96.93	0.80	0.01	113.75
19. Students know they are safe.	0.79	0.01	103.70	0.80	0.01	113.67
School-wide Bullying						
9. Students threaten and bully others.	0.70	0.01	85.86	0.70	0.01	81.55
14. Students worry about others bullying them.	0.56	0.01	46.43	0.57	0.01	43.99
24. Bullying is a problem.	0.60	0.02	36.53	0.60	0.02	37.71
33. Students bully one another.	0.77	0.01	82.30	0.77	0.01	88.63
School-wide Engagement						
1. Most students turn in their homework on time.	0.46	0.01	39.09	0.45	0.01	41.24
6. Most students try their best.	0.55	0.01	56.05	0.56	0.01	62.22
23. Most students follow the rules.	0.65	0.01	78.44	0.65	0.01	87.61
25. Most students like this school.	0.65	0.01	82.41	0.65	0.01	83.70
29. Most students work hard to get good grades.	0.58	0.01	56.90	0.57	0.01	60.65
34. Most students feel happy.	0.70	0.01	96.37	0.69	0.01	99.13

Note. Loading = standardized factor loading; *SE* = standard error; *z* = robust *z* score.

Table II.4						
Fit Statistics Between Groups for Second-order Model (DSCS-S)						
Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	32,414	17,255.97*	427	.921	.046	.035
Elementary	15,096	7,623.04*	427	.926	.042	.033
Middle	10,805	7,195.33*	427	.932	.052	.038
High	6,513	5,828.38*	427	.914	.060	.044
Boys	15,947	8,984.13*	427	.924	.047	.035
Girls	16,467	9,354.66*	427	.929	.046	.036
White	15,223	9,064.70*	427	.927	.046	.036
Black	8,449	4,992.67*	427	.925	.049	.036
Hispanic/Latino	4,178	2,643.80*	427	.93	.046	.035
Asian	1,198	1,073.28*	427	.936	.05	.036
Multi-racial/Other	3,366	2,281.13*	427	.933	.047	.036
Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *p <.001						

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table II. 5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 787.44 (Δdf = 48), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 135.57 (Δdf = 12), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler scaled chi-square difference test = 409.27 (Δdf = 48), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 334.66 (Δdf = 13), p < .001, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female students yielded fit statistics that suggested adequate model fit (see Table II.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 53.44 (Δdf =

24), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 45.79($\Delta df = 6$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 206.19 ($\Delta df = 24$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 334.66 ($\Delta df = 13$), $p < .001$, $\Delta CFI < .01$.

Measurement invariance across race/ethnicity. A model testing the configural invariance across White, Black, and Hispanic students yielded fit statistics that suggested adequate model fit (see Table II.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 261.78 ($\Delta df = 96$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 167.00 ($\Delta df = 24$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 200.99($\Delta df = 96$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 172.30 ($\Delta df = 27$), $p < .001$, $\Delta CFI < .01$.

Table II.5

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DSCS-S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	21,200.74*	1281	.925	.050	.038
Model 2	21,988.80*	1329	.923	.051	.038
Model 3	22,051.89*	1341	.922	.053	.038
Model 4	22,839.69*	1389	.920	.053	.038
Model 5	23,053.26*	1402	.919	.053	.038
Gender group					
Model 1	21,200.74*	1281	.925	.050	.038
Model 2	21,988.80*	1329	.923	.051	.038
Model 3	22,051.89*	1341	.922	.053	.038
Model 4	22,839.69*	1389	.920	.053	.038
Model 5	23053.26*	1402	.919	.053	.038
Race/Ethnicity group					
Model 1	20,083.43*	2135	.929	.047	.036
Model 2	20,380.70*	2231	.928	.047	.035
Model 3	20,540.11*	2255	.928	.050	.035
Model 4	21,413.00*	2351	.925	.050	.035
Model 5	21,658.70*	2378	.924	.050	.035

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.

*p <.001

Correlations among Factors

To examine the relative independence of scores for the seven subscales and the extent to which they assess the "school climate" construct, correlations among scores on each of the subscales were computed. For these analyses, and all other analyses that follow, we used manifest indicators of the factor (i.e., sum of raw scores of items on the derived subscales and total scale). As shown in Table II.6, for all students combined, correlation coefficients among subscales ranged in strength of value (i.e., absolute value) from .16 to .67, with a median of .52. Those results indicate that 55% ($1 - .67^2 = .55$) to 97% ($1 - .16^2 = .97$) of the variance in each subscale score is independent of the scores on the other subscales.

Note that the low correlations for Bullying School-wide suggest that this factor, as measured by the DSCS-S, does not measure the construct of school climate as well as the other factors (and thus, may be measuring a separate construct; however, this was not found on the teacher survey).

Table II.6

Correlational Coefficients between Subscale and Total Scale Scores for the Full Sample (DSCS-S)

	1	2	3	4	5	6	7
1. Teacher–Student Relations							
2. Student–Student Relations	.56						
3. School Safety	.58	.64					
4. Clarity of Expectations	.53	.49	.52				
5. Fairness of School Rules	.67	.48	.52	.55			
6. Student Engagement School-wide	.63	.70	.62	.52	.54		
7. Bullying School-wide	-.19	-.41	-.37	-.16	-.16	-.24	
8. Total School Climate	.81	.84	.78	.70	.74	.84	-.50

Note. All correlations are significant at $p < .001$.

Reliability

With respect to the reliability of DSCS−S scores (see Table II.7), across grade levels, gender, and racial/ethnic groups, internal consistency coefficients for each of the seven subscales ranged from .70 to .88.

Table II.7								
Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DSCS-S)								
	Teacher Student Relations	Student Relations	School Safety	Clarity of Expect-ations	Fairness of Rules	Student Engage-ment School-wide	Bullying School-wide	Total Score
Full Sample	.88	.87	.79	.77	.80	.82	.77	.90
Grade Level								
Elementary	.79	.85	.70	.72	.71	.75	.73	.86
Middle	.87	.87	.80	.79	.82	.80	.82	.89
High	.86	.86	.84	.80	.83	.81	.84	.89
Gender								
Boys	.86	.86	.77	.76	.79	.82	.75	.90
Girls	.87	.88	.81	.78	.80	.83	.78	.91
Race/ Ethnicity								
Asian	.88	.88	.82	.80	.80	.85	.76	.92
White	.88	.88	.79	.79	.81	.84	.79	.90
Black	.87	.86	.77	.75	.78	.80	.75	.90
Hispanic/Latino	.87	.88	.81	.76	.76	.81	.69	.91
Asian	.88	.88	.82	.80	.80	.85	.76	.92
Multi-Racial	.88	.87	.79	.77	.80	.82	.77	.91

For the total score of DSCS−S, consisting of the sum of raw scores on all items of the seven subscales, high reliability was found across grade-level, gender, and racial-ethnic groups (range .86 to .91, with overall alpha of .90 for all students combined).

Table II.8 shows reliability coefficients for grades 3-12. As can be seen, the lowest coefficients tend to be at grade 3 where several fall below the recommended level of .70. *For this reason, caution is warranted in interpreting results of at grade 3, and schools might want not to include that level.* If included, it is recommended that the survey be read aloud, as we suspect that some students find it difficult to read and understand all items on this scale, and especially certain subscales.

Table II.8								
Reliability Coefficients for Grades 3-12 (DSCS-S)								
Grade	Teacher Student Relations	Student Relations	School Safety	Clarity of Expect-ations	Fairness of Rules	Student Engage-ment School-wide	Bullying School-wide	Total Score
Third	.73	.84	.65	.67	.62	.73	.65	.85
Fourth	.80	.85	.71	.72	.72	.74	.75	.85
Fifth	.84	.87	.75	.76	.79	.76	.80	.87
Sixth	.87	.87	.79	.77	.82	.79	.81	.89
Seventh	.86	.87	.80	.80	.82	.80	.84	.89
Eighth	.87	.87	.82	.79	.81	.81	.83	.90
Ninth	.87	.86	.84	.82	.84	.81	.82	.90
Tenth	.86	.86	.83	.79	.82	.80	.82	.90
Eleventh	.85	.87	.84	.79	.82	.81	.86	.89
Twelfth	.84	.87	.86	.81	.82	.82	.85	.89

Means and Standard Deviations

Table II.9 presents the means and standard deviations for scores on the seven subscales and the total scale score as a function of grade level, racial/ethnic group, and gender. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by subscale's number of items). Scores can range from 1 (Strongly Disagree) to 4 (Strongly Agree). Table II.10 presents means and standard deviations for grades 3-12.

A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in subscale scores. Results found statistically significant differences for each main effect and for each of the two-way interaction effects. The three-way interaction was not significant. With the exception of grade level, effect sizes were very small, and thus of little practical value. That is, partial eta squared (partial η^2) for those effects was .005 for gender, .01 for race/ethnicity, .002 for grade level x race/ethnicity, .001 for grade level x gender and race/ethnicity x gender, and .000 for grade level x race/ethnicity x gender. Thus, only grade level differences are reported below.

Using Pillai's Trace criteria, the combined dependent variables were significantly related to grade level, $F(14, 2961.00)$, $p < .001$, partial $\eta^2 = .085$. Grade level differences were statistically significant (all *p*s < .001)for all subtests: Teacher-Student Relations, $F = 2285.05$, partial $\eta^2 = .134$; Student-Student Relations, $F = 869.32$, partial $\eta^2 = .055$; Student Engagement School-wide, $F = 1858.45$, partial $\eta^2 = .111$; Clarity of Expectations, $F = 533.31$, partial $\eta^2 = .035$; Fairness of Rules, $F = 1001.63$, partial $\eta^2 = .063$; School Safety, $F = 1151.20$, partial $\eta^2 = .072$, and Bullying School-wide, $F = 43.96$, partial $\eta^2 = .003$.

Follow-up comparisons in grade level differences for the MANOVA using the Bonferroni method showed scores of elementary school students to be higher than those of middle and high school students and scores of high school student to be higher than those of middle

school students on six of the seven subscales, with the exception of School-wide Bullying. For School-wide Bullying, elementary school students scored lower than middle and high school students and high school students scored lower than middle school students. In general, although statistically significant, differences between middle and high school students were much smaller than those between elementary students and students in middle school and high school.

Table II.9

Means and Standard Deviations for DSCS-S Subscale and Scale Scores by Grade Level, Gender, and Race/Ethnicity (DSCS-S)

		Teacher-Student Relations		Student-Student Relations		Clarity of Expectations		Fairness of Rules		School Safety		Student Engagement School-wide		Bullying School-wide		Total	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Elementary																	
Boys	6716	3.52	0.50	3.05	0.59	3.29	0.53	3.22	0.60	3.19	0.56	3.19	0.49	2.40	0.78	3.05	0.34
Girls	6926	3.60	0.47	3.03	0.61	3.33	0.53	3.31	0.56	3.24	0.59	3.16	0.48	2.47	0.78	3.08	0.39
White	6434	3.61	0.45	3.10	0.55	3.34	0.51	3.30	0.57	3.27	0.55	3.16	0.47	2.32	0.78	3.11	0.37
Black	3419	3.47	0.55	2.92	0.67	3.28	0.57	3.19	0.62	3.13	0.64	3.09	0.52	2.58	0.81	2.99	0.42
Hispanic/ Latino	1832	3.56	0.46	3.07	0.57	3.29	0.52	3.27	0.55	3.24	0.58	3.17	0.47	2.62	0.70	3.06	0.36
Asian	523	3.62	0.43	3.19	0.51	3.34	0.50	3.41	0.48	3.35	0.51	3.28	0.43	2.17	0.74	3.19	0.35
Multi-Racial	1434	3.54	0.49	2.96	0.62	3.29	0.55	3.22	0.61	3.16	0.61	3.09	0.50	2.49	0.80	3.06	0.40
Total	13642	3.56	0.49	3.04	0.60	3.31	0.53	3.27	0.59	3.22	0.59	3.14	0.49	2.44	0.79	3.07	0.39
Middle																	
Boys	4910	3.12	0.59	2.74	0.59	3.09	0.56	2.92	0.61	2.81	0.61	2.72	0.53	2.50	0.72	2.76	0.42
Girls	5125	3.06	0.63	2.64	0.59	3.09	0.56	2.92	0.63	2.75	0.64	2.69	0.53	2.63	0.75	2.70	0.44
White	4757	3.18	0.57	2.74	0.55	3.13	0.55	3.00	0.59	2.84	0.61	2.71	0.53	2.50	0.74	2.78	0.43
Black	2491	2.94	0.66	2.59	0.61	3.04	0.58	2.78	0.65	2.68	0.64	2.66	0.61	2.66	0.74	2.64	0.43
Hispanic/ Latino	1344	3.14	0.56	2.73	0.56	3.07	0.52	2.97	0.57	2.83	0.60	2.79	0.49	2.60	0.66	2.77	0.39
Asian	352	3.19	0.56	2.83	0.53	3.13	0.54	3.10	0.55	2.90	0.58	2.84	0.53	2.43	0.71	2.84	0.39
Multi-Racial	1091	2.97	0.66	2.60	0.60	3.05	0.56	2.80	0.65	2.68	0.67	2.63	0.56	2.64	0.75	2.64	0.45
Total	10035	3.09	0.61	2.69	0.58	3.09	0.56	2.92	0.62	2.78	0.63	2.70	0.54	2.57	0.73	2.73	0.43
High																	
Boys	2917	2.87	0.56	2.71	0.52	2.96	0.52	2.76	0.58	2.78	0.59	2.57	0.52	2.40	0.64	2.65	0.39
Girls	3110	2.79	0.53	2.60	0.53	2.98	0.49	2.73	0.55	2.67	0.58	2.53	0.50	2.54	0.65	2.59	0.38
White	2942	2.88	0.53	2.67	0.52	2.99	0.51	2.78	0.56	2.77	0.57	2.52	0.51	2.44	0.65	2.64	0.39
Black	1640	2.76	0.57	2.63	0.54	2.97	0.50	2.68	0.57	2.68	0.60	2.60	0.50	2.52	0.66	2.60	0.37
Hispanic/ Latino	669	2.81	0.54	2.64	0.51	2.95	0.48	2.77	0.54	2.69	0.60	2.56	0.51	2.49	0.62	2.60	0.38
Asian	257	2.95	0.53	2.73	0.52	2.95	0.53	2.88	0.55	2.76	0.57	2.66	0.52	2.48	0.60	2.69	0.39
Multi-Racial	519	2.75	0.56	2.61	0.55	2.91	0.53	2.69	0.61	2.66	0.62	2.52	0.53	2.52	0.68	2.57	0.41
Total	6027	2.83	0.55	2.65	0.53	2.97	0.50	2.75	0.57	2.73	0.59	2.55	0.51	2.48	0.65	2.62	0.39

Table II.10

Means and Standard Deviations for DSCS-S Subscale and Scale Scores for Grades 3-12 (DSCS-S)

		Teacher-Student Relations		Student-Student Relations		Clarity of Expectations		Fairness of Rules		School Safety		Student Engagement School-wide		Bullying School-wide		Total	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
3	4695	3.61	.44	3.22	.60	3.34	.51	3.30	.55	3.24	.58	3.24	.47	2.54	.75	3.10	.36
4	4772	3.58	.48	3.03	.61	3.33	.54	3.30	.58	3.23	.59	3.15	.48	2.43	.81	3.08	.40
5	4655	3.46	.54	2.92	.58	3.24	.55	3.18	.61	3.15	.60	3.00	.49	2.37	.80	2.99	.41
6	3398	3.21	.60	2.75	.58	3.14	.56	3.02	.63	2.84	.63	2.80	.52	2.54	.75	2.80	.43
7	3146	3.05	.59	2.67	.57	3.06	.56	2.88	.61	2.75	.61	2.67	.52	2.59	.75	2.70	.42
8	3011	2.95	.60	2.63	.56	3.04	.54	2.81	.59	2.71	.63	2.60	.54	2.56	.70	2.65	.42
9	1686	2.86	.58	2.66	.54	2.99	.54	2.80	.59	2.71	.61	2.59	.52	2.50	.66	2.64	.40
10	1546	2.81	.54	2.63	.52	2.96	.49	2.70	.57	2.72	.57	2.55	.50	2.50	.63	2.61	.38
11	1581	2.80	.54	2.65	.54	2.96	.49	2.70	.57	2.74	.58	2.53	.51	2.44	.66	2.61	.38
12	1214	2.85	.51	2.66	.51	2.98	.50	2.78	.53	2.75	.59	2.52	.52	2.45	.64	2.63	.37

Concurrent Validity

At the school-wide level, using aggregated scores across all students within each school, we examined correlations between DSCS−S scores, suspension and expulsion rates, and academic achievement. Data for suspensions/expulsions and academic achievement were taken from each school's "school profiles" website, which is maintained by the Delaware Department of Education. Data were for the 2014-2015 school year. Suspension/expulsion data consisted of the percentage of students (non-duplicated count) suspended or expelled that school year. Academic achievement scores consisted of the percentage of students passing the state's examination of the standards of learning in English/Language Arts and Mathematics.

Table II.11 shows correlations of DSCS-S scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level.
Across all three grade levels, the total scale score correlated from .22 to .75 with school-level indices of academic achievement and from -.60 to -.75 with school-level suspensions and expulsions. Note that correlations are often lower for high schools, and fewer are statistically significant, which at least partially can be attributed to the small sample size.

Table II.11

Correlations of Scores on the DSCS-S with Academic Achievement and Suspensions/Expulsions

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Teacher–Student Relations	.540**	.485**	-.420**	.714**	.715**	-.583**	-.041	.108	-.565*
Student–Student Relations	.691**	.649**	-.682**	.751**	.755**	-.740**	.286	.526*	-.837**
Engagement Schoolwide	.531**	.530**	-.585**	.663**	.644**	-.623**	.355	.546**	-.819**
Clarity of Expectations	.463**	.445**	-.316**	.605**	.614**	-.408*	-.021	.077	-.432*
Fairness of Rules	.500**	.463**	-.366**	.690**	.616**	-.772**	-.431*	-.296	-.135
School Safety	.558**	.500**	-.512**	.657**	.669**	-.579**	.451*	.528*	-.691**
Bullying Schoolwide	-.782**	-.687**	.574**	-.708**	-.760**	.676**	-.381	-.510*	-.686**
Total School Climate	.694**	.639**	-.598**	.746*	.743**	-.698**	.223	.393	-.749**

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] *n* = 88 schools, [b] *n* = 28 schools, [c] *n=17* schools.
*$p < .05$. **$p < .01$, ***p < .001 One tailed.

Positive, Punitive, and SEL Techniques Scale−Student (DTS-S)

Confirmatory Factor Analyses

With exceptions noted below for testing of measurement invariance, the same methods used above for DSCS-S were used in the analyses for the Positive, Punitive, and SEL Techniques Scale (DTS-S). Please see the section above for a description of those methods.

The ICCs on the factor scores of the DTS in the full sample ranged from .07 (SEL Techniques) to .10 (Positive Techniques). Because the ICCs indicated that student responses were non-independent and a portion of the variance was accounted for at the school level, CFA accounted for the nesting of students within schools, and individual item responses were centered on the school mean by utilizing the centering command in Mplus.

Based on preliminary exploratory and confirmatory factor analyses (CFA), two items field-tested in 2015 (i.e., #16. *Teachers use just enough punishment; not too much or too little;* and #18. *All students receive rewards for doing a good job.*) were deleted because of the high correlations between #15 and #18, #16 and #18, and #17 and #18; and the high dual loading of #16 under all three factors: positive, punitive and SEL techniques.

A three-factor model was first tested, with each item specified as an indicator of a factor corresponding to the assigned subscale. In addition, two comparison models were tested: a one-factor model, and a second-order model with one higher-order factor and three lower-order factors.

For cross-validation purposes, the sample was randomly divided into two subsamples. The first sample was used to examine model fit for the hypothesized model and the three alternative models. The second sample was used to verify and replicate the final model derived from the first sample.

In order to investigate whether the surveys were of comparable factor structure across different groups of respondents (i.e., elementary, middle, and high school students; racial–ethnic groups; and boys and girls), measurement invariance was tested in a hierarchical fashion by testing configural invariance, weak factorial invariance, and strong factorial invariance (Meredith, 1993; Widaman & Reise, 1997). The purpose of testing configural invariance is to investigate whether groups share the same structure (or if the same items are loading on the same latent factors) in the CFA. When testing for this type of invariance, the pattern of freed and fixed parameters is kept the same across groups, however the estimates for the parameters in the groups are independent. Configural invariance is supported if the fit indices for the groups are adequate. If configural invariance is not achieved, comparing groups on the same scale would be similar to comparing apples with oranges (Chen, 2007; Chen & West, 2008).

If configural invariance between groups is found, the next step is to test for weak factorial invariance to examine whether the groups use an equal unit of measurement in their responses to the survey items. This test is done by constraining the factor loadings of the groups to be equal, with all other parameters estimated independently. Because the subsequent models are nested

within one another, the difference or change between the fit indices for the models were calculated and used to evaluate the pattern invariance. Stringent criteria have been recommended for evaluating weak factorial invariance with total sample sizes greater than 300: a decrease in CFI of at least .010 supplemented by an increase in RMSEA of at least .015 or an increase in SRMR of at least .030 indicates *noninvariance* (Chen, 2007). When groups have large differences in sample size, even more stringent criteria may be imposed in which a decrease in CFI of at least .010 alone indicates *noninvariance*. After weak factorial invariance is found, strong factorial invariance is tested by constraining the factor loadings and intercepts to be equal across the groups. If strong factorial invariance is found, it suggests that the point of origin for the scale is equal across groups. We used the following criteria for evaluating strong factorial invariance: a decrease in CFI of at least .010 supplemented by an increase in RMSEA of at least .015 or increase in SRMR of at least .010 indicates *noninvariance* (Chen, 2007).

Results of Confirmatory Factor Analyses

Comparing three-factor model with alternative models. As shown in Table II.12, the proposed three-factor model yielded adequate fit indices. The one-factor model, the first and most parsimonious model, yielded poor fit statistics. A second-order model with one higher order factor and three lower factors also yielded adequate fit indices (because the model was just identified, each of the fit indices for this model was the same as for the three-factor model). *Although either model might be used, consistent with previous findings and the purposes for which scores are used (i.e., not to provide a general score for techniques, but three separate scores), the three-factor model was selected as the final model.*

Table II.12

Fit Statistics for Models Tested (DTS-S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	13435.62*	104	.671	.091	.089
Three-factor model	3888.40*	104	.907	.053	.048
Second-order model	3888.40*	104	.907	.053	.048

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =16,205. Models were tested on approximately one half of sample, randomly selected.
*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the 3-factor model: χ^2 = 3604.21 (101, *N* =16,205), $p < .001$; CFI = .911, RMSEA = .050, and SRMR = .046. The completely standardized factor loadings were also compared to ensure that there were no large differences across the randomly selected samples. As shown in Table II.13, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table II.14.

Table II.13						
Confirmatory Factor Analysis of the Techniques Scale -Student: Three-factor Model (DTS-S)						
	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Positive						
2. Students are praised often.	0.55	0.01	46.69	0.55	0.01	47.15
5. Students are often given rewards for being good.	0.72	0.01	81.83	0.71	0.01	81.12
8. Teachers often let students know when they are being good.	0.66	0.01	79.25	0.65	0.01	71.41
11. Classes get rewards for good behavior.	0.71	0.01	82.39	0.70	0.01	81.15
14. Teachers use just enough praise and rewards; not too much or too little.	0.64	0.01	55.56	0.64	0.01	53.62
Punitive						
1. Students are punished a lot.	0.61	0.01	53.34	0.63	0.01	67.50
4. Students are often sent out of class for breaking rules.	0.51	0.02	32.39	0.51	0.02	35.30
7. Students are often yelled at by adults.	0.65	0.01	60.97	0.66	0.01	64.09
10. Many students are sent to the office for breaking rules.	0.52	0.02	29.09	0.51	0.02	32.45
13. Students are punished too much for minor things.	0.58	0.01	52.02	0.58	0.01	50.94
SEL						
3. Students are taught to feel responsible for how they act.	0.58	0.01	60.08	0.57	0.01	59.06
6. Students are taught to understand how others think and feel.	0.71	0.01	109.55	0.70	0.01	95.91
9. Students are taught that they can control their own behavior.	0.60	0.01	65.33	0.58	0.01	63.00
12. Students are taught how to solve conflicts with others.	0.69	0.01	91.05	0.68	0.01	69.85
15. Students are taught they should care about how others feel.	0.67	0.01	76.25	0.67	0.01	70.21

17. Students are often asked to help decide what is best for the class or school.	0.50	0.01	39.36	0.50	0.01	35.80
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table II.14

Fit Statistics Between Groups for Three-factor Model (*DTS-S*)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	32,410	6567.76*	101	.905	.051	.044
Elementary	15,096	2837.11*	101	.917	.048	.042
Middle	10,803	3699.83*	101	.887	.058	.057
High	6,511	2613.70*	101	.879	.060	.062
Male	15,946	3445.51*	101	.913	.050	.046
Female	16,464	3904.86*	101	.907	.053	.048
White	15,220	3714.28*	101	.908	.052	.048
Black	8l,448	1851.97*	101	.913	.052	.045
Hispanic/Latino	4,178	1008.98*	101	.919	.047	.046
Asian	1,198	430.10*	101	.895	.055	.052
Multi-racial/Other	3,366	1003.86*	101	.909	.056	.052

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table II.15). The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated that there was weak factorial invariance across grade level: Satorra–Bentler scaled chi-square difference test = 400.51 (Δdf = 26), p < .001, ΔCFI = -.003, ΔRMSEA = -.002, ΔSRMR = .003. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, strong invariance was found across grade level: Satorra–Bentler scaled chi-square difference test = 96.43 (Δdf = 32), p < .001, ΔCFI = -.010, ΔRMSEA = .000, and ΔSRMR = .000.

Measurement invariance across race/ethnicity. A model testing the configural invariance of the confirmatory factor analysis across three different racial–ethnic groups (i.e., White, Black, and Hispanic/Latino) yielded fit statistics suggesting adequate model fit (see Table II.15). Reports from students who indicated Asian or Multi-Racial identity were excluded from the racial–ethnic group measurement invariance analyses due to small sample sizes. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated that there was weak factorial invariance across race-ethnicity: Satorra–Bentler scaled chi-square difference test = 68.33 (Δdf = 26), p < .001, ΔCFI = .000, ΔRMSEA = -.002, and ΔSRMR = .001.

When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance in the starting point of origin for the subscale was found across race: Satorra–Bentler scaled chi-square difference test = 483.99 (Δdf = 32), $p < .001$, ΔCFI = -.009 ΔRMSEA = .000, and ΔSRMR = .000.

Measurement invariance across gender. The test statistics for configural invariance (Model 1) across gender indicated adequate model fit (see Table II.15). The weak factorial invariance model (Model 2) was nested within Model 1. The difference between test statistics for the two models indicated that there was weak factorial invariance across gender: Satorra–Bentler scaled chi-square difference test = 35.98 (Δdf = 13), $p < .001$, ΔCFI = -.001, ΔRMSEA = -.001, and ΔSRMR = .001. The strong factorial model (Model 3) was nested within Model 2. The difference between test statistics for the two models indicated that there was strong factorial invariance across gender: Satorra–Bentler scaled chi-square difference test = 554.93 (Δdf = 16), $p < .001$, ΔCFI = -.007, ΔRMSEA = .000, and ΔSRMR = .000.

Table II.15

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DTS-S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	9,403.47*	303	.896	.054	.053
Model 2	9,714.66*	329	.893	.057	.051
Model 3	10,657.82*	361	.883	.057	.051
Gender group					
Model 1	7,357.25*	202	.910	.051	.047
Model 2	7,456.48*	215	.909	.052	.046
Model 3	8,010.55*	231	.902	.052	.046
Race/Ethnicity group					
Model 1	6,657.57*	303	.912	.051	.048
Model 2	6,718.49*	329	.912	.052	.046
Model 3	7,370.99*	361	.903	.052	.046

Note. Model 1: Configural invariance. Model 2: Weak factorial invariance. Model 3: Strong factorial invariance. $\chi 2$= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Correlations among Factors

For all students combined, use of positive behavioral techniques correlated -.23 with use of punitive techniques and .68 with use of SEL techniques. Use of punitive techniques correlated -.23 with use of SEL techniques (all p's < .001).

Reliability

As shown in Table II.16, for all students combined across grade levels, internal consistency coefficients ranged from .75 to .85. The reliability of scores for each of the three subscales also was computed for each subgroup (5 racial–ethnic groups x 2 genders x 3 grade levels). Coefficients ranged from = .71 (Punitive Techniques for high school and Black students) to .86 (Positive Behavior Techniques for female students).

There were negligible differences between the alpha coefficients for elementary school (range .73 to .76), middle school (range .72 to .82), and high school (range .71 to .85) students; between White (range .75 to .85), Black (range .71 to .84), Hispanic/Latino (range .74 to .83), Asian (range .75 to .83), and Multi-Racial (range .74 to .85) students; and between boys (range .73 to .83) and girls (range .76 to .86).) Across all subgroups, the lowest alpha coefficients were for the Punitive Techniques subscale. Coefficients also tended to be lower among students in elementary school. Similar results were found when scores were examined separately in grades 3-12, as shown in Table II.17. As can be seen, the lowest coefficients tended to be at grade 3 where the alpha coefficient for the Positive Behavioral Techniques subscale fall below the recommended level of .70. *For this reason, caution is warranted in interpreting results of at grade 3, and schools might want not to include that level.* If included, it is recommended that the survey be read aloud, as we suspect that some students find it difficult to read and understand all items on this scale, and especially certain subscales.

Table II.16

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DTS-S)

	Positive Behavior Techniques	Punitive Techniques	SEL Techniques
Full Sample	.85	.75	.80
Grade Level			
Elementary	.73	.75	.76
Middle	.82	.72	.80
High	.85	.71	.81
Gender			
Boys	.83	.73	.79
Girls	.86	.76	.81
Race/Ethnicity			
White	.85	.75	.81
Black	.84	.71	.79
Hispanic/ Latino	.83	.74	.80
Asian	.83	.75	.81
Multi-Racial	.85	.74	.80

Table II.17			
Reliability Coefficients by Grade (DTS-S)			
Grade	Positive Behavior Techniques	Punitive Techniques	SEL Techniques
Third	.67	.74	.72
Fourth	.72	.75	.75
Fifth	.78	.74	.80
Sixth	.81	.75	.80
Seventh	.81	.71	.79
Eighth	.83	.70	.81
Ninth	.85	.74	.81
Tenth	.85	.69	.81
Eleventh	.84	.70	.81
Twelfth	.86	.69	.81

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table II.18. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table II.19 shows those scores as a function of grades 3-12. A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in subscale scores. Results of the MANOVA found statistically significant differences for the main effects of grade level and race/ethnicity but not for gender ($p < .01$). Two-way interaction effects were statistically significant for grade level and race/ethnicity, grade level and gender, and race/ethnicity and gender, but with one exception: The two-interaction effect was not significant of punitive techniques. The three-way interaction effect was not significant.

With the exception of grade level, effect sizes for the main effects and interactions were very small, and thus of little practical value. That is, partial eta squared (partial η2) for those effects was .000 for gender, gender x race/ethnicity, and gender x race/ethnicity x grade level; .001 for gender x grade level; .002 for grade level x gender; and .012 for race/ethnicity. Thus, only grade level differences are reported below.

The combined dependent variables were significantly related to grade level, $F(6, 61300) = 874.11$, $p < .001$, partial $\eta^2 = .079$. Grade level differences were statistically significant (all ps < .001 for Positive Behavior Techniques, $F = 2532.35$, partial $\eta^2 = .142$; SEL Techniques, $F = 876.31$, partial $\eta 2 = .054$; and Punitive Behavior Techniques, $F = 542.20$, partial $\eta 2 = .034$.

Using the Bonferroni method, follow-up comparisons in grade level differences in scores for Positive Behavioral Techniques and SEL Techniques showed that scores of elementary students were higher than those of middle and high school students on both Positive Behavior Techniques

and SEL Techniques. Scores for middle school students on these two subscales were significantly higher than those of high school students. Similarly, for Punitive Techniques, scores of elementary students were lower than those of middle and high school students; however, scores of middle school students were slightly higher than high school students (albeit significantly higher due to large sample size).

Table II.18

Means and Standard Deviations for Subscale Scores by Grade Level, Gender, and Race/Ethnicity (DTS-S)

		Positive Behavior Techniques		Punitive Techniques		SEL Techniques	
	N	Mean	SD	Mean	SD	Mean	SD
Elementary							
Boys	7146	3.14	0.55	2.38	0.68	3.16	0.52
Girls	7277	3.22	0.53	2.33	0.69	3.20	0.51
White	6760	3.15	0.54	2.23	0.66	3.18	0.51
Black	3671	3.21	0.56	2.55	0.70	3.19	0.54
Hispanic/Latino	1932	3.21	0.50	2.44	0.65	3.19	0.50
Asian	538	3.19	0.51	2.03	0.58	3.27	0.48
Multi-Racial	1522	3.19	0.56	2.41	0.71	3.15	0.55
Total	14423	3.18	0.54	2.35	0.69	3.18	0.52
Middle							
Boys	4946	2.64	0.63	2.68	0.58	2.90	0.56
Girls	5156	2.65	0.64	2.68	0.59	2.86	0.58
White	4766	2.63	0.62	2.57	0.58	2.89	0.57
Black	2518	2.64	0.66	2.84	0.58	2.86	0.59
Hispanic/Latino	1354	2.72	0.56	2.72	0.55	2.93	0.54
Asian	341	2.74	0.58	2.51	0.55	3.03	0.51
Multi-Racial	1123	2.58	0.68	2.79	0.58	2.82	0.60
Total	10102	2.64	0.63	2.68	0.59	2.88	0.52
High							
Boys	2969	2.35	0.61	2.63	0.54	2.73	0.57
Girls	3187	2.27	0.59	2.65	0.53	2.70	0.55
White	3014	2.25	0.58	2.59	0.53	2.67	0.55
Black	1676	2.36	0.62	2.72	0.53	2.77	0.55
Hispanic/Latino	677	2.39	0.59	2.63	0.54	2.76	0.55
Asian	255	2.49	0.57	2.50	0.49	2.78	0.58
Multi-Racial	534	2.30	0.63	2.73	0.53	2.71	0.59
Total	6156	2.31	0.60	2.64	0.53	2.71	0.56

Table II.19							
Means and Standard Deviations for Subscale Scores by Grade (DTS-S)							
		Positive Behavior Techniques		Punitive Techniques		SEL Techniques	
Grade	N	Mean	SD	Mean	SD	Mean	SD
3	4977	3.27	0.51	2.33	0.71	3.26	0.50
4	5086	3.20	0.53	2.35	0.68	3.19	0.51
5	4878	3.04	0.57	2.41	0.65	3.07	0.54
6	3441	2.76	0.62	2.63	0.62	2.96	0.57
7	3137	2.59	0.62	2.73	0.57	2.87	0.56
8	3006	2.51	0.61	2.70	0.55	2.80	0.57
9	1702	2.37	0.62	2.64	0.56	2.80	0.56
10	1602	2.27	0.60	2.68	0.52	2.69	0.55
11	1621	2.27	0.58	2.62	0.53	2.65	0.56
12	1231	2.33	0.60	2.61	0.51	2.70	0.55

Concurrent Validity

At the school-wide level, using aggregated scores across all students within each school, correlations were examined between DTS-S scores, suspension and expulsion rates, and academic achievement scores. Data for suspensions/expulsions and academic achievement were taken from each school's "school profiles" website, which is maintained by the Delaware Department of Education. Data are for the 2014-2015 school year. Suspension/expulsion data consist of the percentage of students (non-duplicated count) suspended or expelled that school year. Academic achievement scores consist of the percentage of students passing the state's examination of the standards of learning in English/Language Arts and Mathematics.

Table II.20 shows correlations of DTS-S scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level. As shown, whereas scores for on use of punitive and SEL techniques correlated as predicted with suspensions and academic achievement, scores on use of positive techniques failed to do so.

Table II.20

Correlations between Techniques Scale-S and Academic Achievement and Suspensions/Expulsions (DTS-S)

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Punitive Techniques	-.764**	-.714**	.634**	-.790**	-.822**	.735**	-.147*	-.473*	.726**
Positive Techniques	-.033	-.030	-.016	.113	.102	-.118	-.460	-.332	-.262
SEL Techniques	.374**	.325**	-.325**	.580**	.610**	-.619**	-.199	-.181	-.151

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n = 76 schools, [b] n = 28 schools, [c] n = 18 schools.
*p < .05. **p < .01, *** p <.001. One tailed.

Delaware Bullying Victimization Scale– Student (DBVS-S)

As noted in Chapter 1 (pp. 17-19), this scale consists of four subscales: Verbal, Physical, Social/Relational, and Cyberbullying. Because there is debate among researchers as to whether or not cyberbullying should be viewed as a separate construct from the other three forms of bullying (e.g., Olweus, 2012), we present results of confirmatory factor analyses performed on both three factors and four factors.

Note that item 13, "I was bullied in this school," is not included on any of the subscales, and thus not used in analyses below. This item was designed to stand alone to examine if students that report such behaviors as teasing also report that they are "bullied."

The same methods used for the scales above were used in the confirmatory factor analyses for the DSCS-S. This included centering item responses on the school mean to account for the clustering of students within schools.

For both the three-factor and four-factor versions of the DBVS-S, the proposed second-order model with one higher-order factor and three (or four) lower-order factors was first tested. As alternative models, a one-factor model, a bifactor model, and a three-factor (or four-factor) model were tested.

Results of Confirmatory Factor Analyses for DBVS-S with Three Subscales

Comparing second-order model with alternative models. As shown in Table II.21, the proposed three-factor second-order model yielded adequate fit indices and the one-factor model yielded poor fit statistics. Although the bifactor model yielded adequate fit indices, it failed to converge on the Hispanic/Latino and Asian groups in the later multi-group analysis. When a three-factor model was tested, each of the fit indices for this model was the same as the three-factor second-order model because the model was just identified. As the total scores of bullying victimization based on the three subscale scores were used, the second-order model was selected as the final model.

Table II.21

Fit Statistics for Models Tested (DBVS-S including Three Subscales)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	3795.00*	54	.897	.043	.072
Three-factor model	1639.53*	51	.956	.030	.049
Second-order model	1639.53*	51	.956	.030	.049
Bifactor model	782.80*	42	.980	.019	.037

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =13,227. Models were tested on approximately one half of sample, randomly selected.
*$p < .001$

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: χ^2 = 1831.31 (51, *N* =13,293), $p < .001$; CFI = .955, RMSEA = .051, and SRMR = .031. The completely standardized factor loadings were also compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table II.22, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table II.23.

Table II.22

Confirmatory Factor Analysis of the DBVS-S including Three Subscales

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: Bullying Victimization						
Verbal Bullying Victimization	0.93	0.00	236.77	0.93	0.00	229.76
Physical Bullying Victimization	0.91	0.01	138.82	0.91	0.01	148.35
Social Bullying Victimization	0.95	0.01	164.85	0.96	0.01	185.86
First-order Factor 1: Verbal Bullying Victimization						
1. I was teased by someone saying hurtful things to me.	0.82	0.01	124.44	0.82	0.01	121.58
4. A student said mean things to me.	0.87	0.01	183.56	0.86	0.01	169.29
7. I was called names I didn't like.	0.88	0.00	202.91	0.88	0.00	209.22
10. Hurtful jokes were made up about me.	0.84	0.01	127.77	0.84	0.01	124.60
First-order Factor 2: Physical Bullying Victimization						
2. I was pushed or shoved on purpose.	0.76	0.01	94.00	0.76	0.01	95.05
5. I was hit or kicked and it hurt.	0.79	0.01	79.52	0.79	0.01	91.77
8. A student stole or broke something of mine on purpose	0.75	0.01	62.64	0.75	0.01	63.78
11. A student threatened to harm me.	0.81	0.01	94.33	0.82	0.01	100.45
First-order Factor 3: Social Bullying Victimization						
3. Students left me out of things to make me feel badly.	0.76	0.01	78.10	0.76	0.01	85.55

6. A student told/got others not to like me.	0.87	0.01	154.18	0.87	0.01	160.07
9. A student got others to say mean things about me.	0.89	0.01	169.63	0.89	0.01	178.19
12. Students told another student not to be friends with me because the other students didn't like me.	0.87	0.01	137.03	0.86	0.01	122.55
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table II.23

Fit Statistics Between Groups for Second-order Model (DBVS-S including 3 Subscales)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	26,488	3,186.54*	51	.956	.030	.048
Elementary	9, 236	919.71*	51	.970	.027	.043
Middle	10,751	1,763.44*	51	.966	.033	.056
High	6,501	1,106.27*	51	.961	.033	.056
Male	13,054	1,548.82*	51	.958	.028	.047
Female	13,434	1,752.12*	51	.956	.033	.050
White	12,381	1,760.68*	51	.957	.031	.052
Black	6,861	804.33*	51	.959	.028	.046
Hispanic/Latino	3,525	525.51*	51	.954	.034	.051
Asian	1,006	172.50*	51	.959	.035	.049
Multi-Racial	2,715	392.51*	51	.959	.033	.050

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.

*$p < .001$

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table II.24). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 114.08 ($\Delta df = 18$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 22.74 ($\Delta df = 4$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler

scaled chi-square difference test = 82.19 (Δdf = 8), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 870.18 (Δdf = 5), p <.001, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female students yielded fit statistics that suggested adequate model fit (see Table II.24). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 76.26 (Δdf = 9), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 291.81 (Δdf = 2), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 7,573.57 (Δdf = 9), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 69.62 (Δdf = 2), p < .001, ΔCFI < .01.

Measurement invariance across race. A model testing the configural invariance across White, Black, and Hispanic/Latino students yielded fit statistics that suggested adequate model fit (see Table II.24). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 76.73(Δdf = 18), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 53.92 (Δdf = 4 p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race: Satorra–Bentler scaled chi-square difference test = 99.49 (Δdf = 18), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race: Satorra–Bentler scaled chi-square difference test = 470.70 (Δdf = 5), p < .001, ΔCFI < .01.

Table II.24

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DBVS-S including 3 Subscales)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	3,848.50*	153	.965	.031	.052
Model 2	4,075.02*	171	.963	.033	.051
Model 3	4,043.76*	175	.963	.034	.050
Model 4	4,459.36*	193	.959	.034	.050
Model 5	4,574.87*	198	.958	.034	.050
Gender group					
Model 1	3,291.55*	102	.957	.031	.049
Model 2	3,428.51*	111	.955	.031	.048
Model 3	3,733.41*	113	.951	.044	.049
Model 4	4,030.64*	122	.947	.044	.049
Model 5	4,096.72*	124	.946	.044	.049
Race/Ethnicity group					
Model 1	3,042.32*	153	.956	.031	.05
Model 2	3,185.51*	171	.955	.032	.048
Model 3	3,240.36*	175	.954	.035	.048
Model 4	3,573.46*	193	.949	.035	.048
Model 5	3,666.01*	198	.948	.035	.048

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Results of Confirmatory Factor Analyses for DBVS-S with Four Subscales (Including Cyberbullying):

Comparing second-order model with alternative models. The proposed four-factor second-order model yielded adequate fit indices: χ^2 = 1,904.14 (98, N =8,636), p < .001; CFI = .948, RMSEA = .036, and SRMR = .048. As illustrated in Table II.25, a one-factor model, the first and most parsimonious model, yielded poor fit statistics. Although the bifactor model based on the first randomly-split approximately half of the sample yielded adequate fit indices, it failed to

converge on the high school group and some racial-ethnic subgroups. When a four-factor model was tested, it yielded adequate fit indices: χ^2 = 1,904.14 (100, *N* = 8,636), *p* < .001; CFI = .953, RMSEA = .031, and SRMR = .046. When the seven-factor model and the nested second-order model were compared, the Satorra–Bentler scaled chi-square difference test = 194.52 (Δdf =2), *p* < .001 indicated that four-factor correlation model had a significantly better fit than the four-factor second-order model.

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: χ^2 = 2204.05 (51, *N* =8,636), *p* < .001; CFI = .949, RMSEA = .049, and SRMR = .037. The completely standardized factor loadings were also compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table II.25, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table II.26.

Table II.25

Confirmatory Factor Analysis of the *Four Factor Second-order Model of DBVS-S including Four Subscale*

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: Bullying Victimization						
Verbal Bullying Victimization	0.91	0.00	206.93	0.91	0.01	175.11
Physical Bullying Victimization	0.92	0.01	107.21	0.92	0.01	114.54
Social Bullying Victimization	0.96	0.01	157.36	0.96	0.01	175.24
Cyber Bullying Victimization	0.74	0.02	42.90	0.73	0.02	41.20
First-order Factor 1: Verbal Bullying Victimization						
1. I was teased by someone saying hurtful things to me.	0.85	0.01	120.73	0.84	0.01	114.69
4. A student said mean things to me.	0.89	0.01	164.13	0.88	0.01	162.99
7. I was called names I didn't like.	0.89	0.01	184.28	0.89	0.01	190.77
10. Hurtful jokes were made up about me.	0.86	0.01	118.57	0.86	0.01	108.35
First-order Factor 2: Physical Bullying Victimization						
2. I was pushed or shoved on purpose.	0.78	0.01	80.82	0.78	0.01	86.47
5. I was hit or kicked and it	0.82	0.01	72.11	0.82	0.01	80.08

hurt.						
8. A student stole or broke something of mine on purpose	0.77	0.02	50.46	0.77	0.02	51.96
11. A student threatened to harm me.	0.83	0.01	89.96	0.84	0.01	97.59
First-order Factor 3: Social Bullying Victimization						
3. Students left me out of things to make me feel badly.	0.79	0.01	71.88	0.78	0.01	79.69
6. A student told/got others not to like me.	0.89	0.01	162.15	0.88	0.01	170.18
9. A student got others to say mean things about me.	0.90	0.01	176.03	0.90	0.01	150.25
12. Students told another student not to be friends with me because the other students didn't like me.	0.89	0.01	131.30	0.89	0.01	140.07
First-order Factor 4: Cyber Bullying Victimization						
14. A student *sent me* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging.	0.87	0.01	94.68	0.86	0.01	68.76
15. A student *sent to others* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging	0.84	0.01	84.31	0.84	0.01	63.85
16. A student *posted* something mean or hurtful about me on a social media website such as Facebook, Twitter, or Instagram.	0.87	0.01	75.95	0.88	0.01	71.23
17. A student *pretending to be me* sent or posted something hurtful or mean *about me or others* using text messaging, a social media website, email, or a similar method.	0.81	0.02	51.19	0.82	0.02	47.67
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table II.26

Fit Statistics Between Groups for Four-factor Second-order Model of DBVS-S (including four Subscales)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Secondary School Sample	17,266	3,989.10	100	.953	.036	.047
Middle	10,755	2,666.74	100	.960	.036	.049
High	6,511	1,709.92	100	.961	.035	.050
Male	8,444	1,731.48	100	.958	.033	.044
Female	8,822	2,170.21	100	.945	.040	.048
White	8,190	2,125.84	100	.948	.036	.050
Black	4,518	988.66	100	.953	.035	.044
Hispanic	2,165	694.97	100	.937	.042	.052
Asian	639	242.93	100	.949	.041	.047
Multi-Racial	1,754	460.13	100	.953	.039	.045

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.

Measurement invariance across grade level. A model testing the configural invariance across middle and high schools yielded fit statistics that suggested adequate model fit (see Table II.27). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 70.97 ($\Delta df = 12$), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 1491.52 ($\Delta df = 3$), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler scaled chi-square difference test = 42.15 ($\Delta df = 12$), $p <.001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 2.78 ($\Delta df = 3$), p = ns, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female students yielded fit statistics that suggested adequate model fit (see Table II.27). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of

first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 250.56 ($\Delta df = 12$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 205.46 ($\Delta df = 3$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 364.44 ($\Delta df = 12$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 4.68 ($\Delta df = 3$), p = ns, $\Delta CFI < .01$.

Measurement invariance across race/ethnicity. A model testing the configural invariance across White, Black, and Hispanic/Latino students yielded fit statistics that suggested adequate model fit (see Table II.27). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 164.24 ($\Delta df = 24$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 56.33 ($\Delta df = 6$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 37.47 ($\Delta df = 24$), $p < .05$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 19.31 ($\Delta df = 7$), $p < .05$, $\Delta CFI < .01$.

Table II.27

Fit Statistics for Confirmatory Factor Analysis of Four-factor Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DBVS-S including Four Subscales)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels (Across Middle and High Schools)					
Model 1	4,374.78*	200	.960	.036	.049
Model 2	4,440.29*	212	.960	.037	.048
Model 3	4,746.95*	215	.957	.056	.049
Model 4	5,011.60*	227	.955	.056	.049
Model 5	5,077.71*	230	.954	.056	.049
Gender group					
Model 1	3,872.96*	200	.952	.037	.046
Model 2	4,122.43*	212	.949	.041	.046
Model 3	4,381.20*	215	.946	.05	.047
Model 4	4,625.58*	227	.943	.05	.047
Model 5	4,686.56*	230	.942	.05	.047
Race/Ethnicity group					
Model 1	3,726.99*	300	.947	.037	.048
Model 2	3,896.76*	324	.944	.040	.047
Model 3	3,949.27*	330	.944	.044	.047
Model 4	4,236.05*	354	.940	.044	.047
Model 5	4,319.62*	361	.938	.044	.047

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.

*p <.001

Correlations among Factors

For all students combined, verbal bullying correlated .76 with physical bullying, .82 with social/relational bullying, and .55 with cyberbullying. Physical bullying correlated .78 with social/relational bullying and .64 with cyberbullying. Social/relational bullying correlated .65 with cyberbullying.

Reliability

As shown in Table II.28, for all students combined across grade levels, internal consistency coefficients for each of the four subscales ranged from .86 to .92. The reliability of scores for each of the four subscales also was computed for each subgroup (5 racial–ethnic groups x 2 genders x 3 grade levels). Coefficients ranged from = .83 (Physical Bullying for elementary students) to .93 (Verbal Bullying for middle and high school students and Cyberbullying for Asian males).

There were negligible differences between the alpha coefficients for elementary school (range .83 to .90), middle school (range .86 to .93), and high school (range .91 to .93) students; between White (range .85 to .92), Black (range .87 to .92), Hispanic/Latino (range .87 to .92), Asian (range .88 to .93), and Multi-Racial (range .87 to .92) students; and between boys (range .88 to .93) and girls (range .84 to .92). Across all subgroups, the lowest alpha coefficients were for the Physical Bullying subscale. Coefficients also tended to be lower among students in elementary school. Similar results were found when scores were examined separately in grades 3-12, as shown in Table II.29.

Table II.28

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DBVS-S)

	Verbal	Physical	Social/ Relational	Cyber	Total (excludes Cyber)	Total (includes Cyber)
Full Sample	.92	.86	.91	.90	.95	.96
Grade Level						
Elementary (Grades 4 & 5)	.90	.83	.86	N/A	.94	N/A
Middle	.93	.86	.92	.86	.95	.95
High	.93	.91	.93	.92	.96	.97
Gender						
Boys	.92	.88	.92	.93	.96	.96
Girls	.92	.84	.90	.88	.95	.95
Race/Ethnicity						
White	.92	.85	.91	.89	.95	.95
Black	.91	.87	.90	.92	.95	.96
Hispanic	.92	.87	.91	.92	.95	.96
Asian	.90	.88	.91	.93	.95	.96
Multi-Racial	.92	.87	.90	.91	.95	.96

Table II.29						
Reliability Coefficients by Grade (DBVS-S)						
Grade	Verbal	Physical	Social/ Relational	Cyber	Total (excludes Cyber)	Total (includes Cyber)
Third	N/A	N/A	N/A	N/A	N/A	N/A
Fourth	.89	.83	.88	N/A	.94	N/A
Fifth	.91	.84	.89	N/A	.95	N/A
Sixth	.93	.85	.92	.88	.95	.95
Seventh	.93	.86	.91	.88	.95	.95
Eighth	.93	.87	.92	.89	.95	.95
Ninth	.92	.91	.93	.93	.96	.97
Tenth	.93	.91	.93	.93	.96	.97
Eleventh	.92	.90	.93	.91	.96	.96
Twelfth	.94	.93	.95	.94	.97	.97

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table II.30. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table II.31 shows those scores as a function of grades 3-12. A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in subscale scores for verbal, physical, and relational bullying. Results of the MANOVA found statistically significant ($p < .01$) main effects for grade level, race/ethnicity, and gender effects. Significant interaction effects were found for grade level and race/ethnicity and for gender and race/ethnicity, but not for grade level and gender nor for the three-way interaction. However, the effect sizes for all significant effects were very small and thus of little practical value. Partial eta squared statistics were .002 for grade level, .003 for race/ethnicity, and .014 for gender, with no interactions exceeding .001.

A separate 2 (grade level; middle and high school) X 5 (racial/ethnic group) X 2 (gender) analysis of variance ANOVA was conducted to examine differences in cyberbullying. No main effects or interactions yielded a partial eta squared greater than .004, and thus those differences are of little, if any, practical value and not presented here

Table II.30

Means and Standard Deviations for Subscale and Scale Scores by Grade Level, Gender, and Race/Ethnicity (DSCS-S)

		Verbal		Physical		Social/ Relational		Cyber		Total (Excludes Cyber)		Total (Includes Cyber)	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Elementary													
Boys	4614	2.01	1.32	1.70	1.05	1.70	1.16	N/A	N/A	1.80	1.10	N/A	N/A
Girls	4622	1.99	1.33	1.52	0.93	1.72	1.18	N/A	N/A	1.74	1.06	N/A	N/A
White	4195	1.96	1.28	1.56	0.92	1.66	1.11	N/A	N/A	1.73	1.02	N/A	N/A
Black	2348	2.18	1.45	1.76	1.15	1.90	1.33	N/A	N/A	1.94	1.21	N/A	N/A
Hispanic	1364	1.81	1.22	1.51	0.96	1.60	1.10	N/A	N/A	1.64	1.01	N/A	N/A
Asian	367	1.68	1.00	1.42	0.76	1.44	0.86	N/A	N/A	1.51	0.79	N/A	N/A
Multi Racial	962	2.09	1.40	1.67	1.06	1.76	1.19	N/A	N/A	1.84	1.13	N/A	N/A
Total	9236	2.00	1.33	1.61	1.00	1.71	1.17	N/A	N/A	1.77	1.08	N/A	N/A
Middle													
Boys	5237	2.02	1.38	1.68	1.10	1.63	1.19	1.25	0.75	1.78	1.15	1.64	0.97
Girls	5148	2.06	1.39	1.52	0.93	1.74	1.21	1.34	0.76	1.77	1.08	1.66	0.93
White	5006	2.08	1.37	1.59	0.98	1.71	1.19	1.29	0.72	1.79	1.09	1.66	0.93
Black	2690	2.08	1.45	1.66	1.12	1.73	1.25	1.30	0.79	1.82	1.18	1.68	1.01
Hispanic	1421	1.81	1.27	1.47	0.92	1.58	1.12	1.25	0.73	1.62	1.02	1.52	0.89
Asian	363	1.95	1.22	1.52	0.89	1.49	0.95	1.22	0.66	1.65	0.92	1.55	0.81
Multi Racial	1175	2.11	1.44	1.67	1.11	1.74	1.24	1.37	0.89	1.83	1.16	1.72	1.03
Total	10655	2.04	1.39	1.60	1.02	1.69	1.17	1.29	.0.76	1.77	1.11	1.65	0.95
High													
Boys	3102	1.83	1.29	1.57	1.11	1.57	1.16	1.39	0.98	1.66	1.14	1.59	1.05
Girls	3289	1.80	1.18	1.38	0.87	1.61	1.11	1.36	0.83	1.60	0.98	1.54	0.90
White	3104	1.83	1.20	1.43	0.90	1.56	1.08	1.35	0.83	1.61	0.99	1.54	0.91
Black	1749	1.82	1.28	1.55	1.11	1.64	1.21	1.43	1.01	1.67	1.14	1.61	1.06
Hispanic	718	1.69	1.21	1.46	1.02	1.55	1.13	1.31	0.86	1.57	1.07	1.51	0.98
Asian	272	1.85	1.24	1.50	1.14	1.60	1.19	1.40	1.08	1.65	1.15	1.59	1.09
Multi Racial	548	1.87	1.29	1.52	1.02	1.64	1.17	1.40	0.93	1.67	1.08	1.60	0.97
Total	6391	1.82	1.23	1.48	1.00	1.59	1.14	1.37	0.91	1.63	1.06	1.56	0.97

Table II.31

Means and standard deviations for subscale and scale scores for grades 3-12 (DSCS-S)

		Verbal		Physical		Social/ Relational		Cyber		Total (Excludes Cyber)		Total (Includes Cyber)	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	4918	2.04	1.36	1.68	1.06	1.76	1.21	N/A	N/A	1.83	1.12	N/A	N/A
5	4800	1.97	1.32	1.56	0.96	1.67	1.15	N/A	N/A	1.73	1.05	N/A	N/A
6	3627	2.04	1.40	1.61	1.03	1.70	1.23	1.26	0.70	1.78	1.13	1.65	0.96
7	3353	2.03	1.37	1.59	1.00	1.67	1.16	1.28	0.74	1.76	1.09	1.64	0.93
8	3193	2.02	1.36	1.57	1.01	1.67	1.18	1.35	0.83	1.75	1.09	1.65	0.97
9	1785	1.91	1.29	1.54	1.05	1.63	1.18	1.37	0.91	1.69	1.10	1.61	1.00
10	1663	1.79	1.20	1.45	0.96	1.59	1.12	1.38	0.92	1.61	1.03	1.56	0.96
11	1680	1.76	1.17	1.43	0.93	1.54	1.07	1.35	0.86	1.57	0.99	1.51	0.91
12	1263	1.79	1.26	1.48	1.04	1.61	1.18	1.40	0.95	1.63	1.10	1.57	1.02

Concurrent Validity

At the school-wide level, using aggregated scores across all students within each school, correlations were examined between DBVS-S scores, suspension and expulsion rates, and academic achievement. Data for suspensions/expulsions and academic achievement were taken from each school's "school profiles" website, which is maintained by the Delaware Department of Education. Data are for the 2014-2015 school year. Suspension/expulsion data consist of the percentage of students (non-duplicated count) suspended or expelled that school year. Academic achievement scores consist of the percentage of students passing the state's examination of the standards of learning in English/Language Arts and Mathematics.

Table II.32 shows correlations of DBVS-S scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level.

Table II.32

Correlations between DBVS-S and Academic Achievement and Suspensions/Expulsions (DSCS-S)

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Verbal Bullying	-.547**	-.483**	.537**	-.462**	-.375*	.419*	-.133	-.298	.398
Physical Bullying	-.630**	-.582**	.566**	-.539**	-.447**	.447**	-.195	-.300	.356
Social/ Relational Bullying	-.611**	-.562**	.515**	-.480*	-.417*	.380*	-.057	-.224	.329
Cyber Bullying	N/A	N/A	N/A	-.366*	-.338*	.206	-.070	-.210	.319
Total Bullying without Cyber Bullying	-.601**	-.546**	.548**	-.482**	-.398**	.399*	-.124	-.264	.354
Total Bullying with Cyber Bullying	N/A	N/A	N/A	-.469**	-.386*	.368*	-.116	-.255	.348

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n = 76 schools, [b] n = 28 schools, [c] n = 1*8* schools.
*p < .05. **p < .01, *** p < .001. One tailed.

Delaware Student Engagement Scale (DSES)

The same statistical methods used for the DSCS-S and DBVS-S, as presented above, were used for the DSES. This included testing of a proposed second-order model consisting of a three lower-order factors (cognitive, behavioral, and emotional engagement) and a higher-order factor of engagement.

Results of Confirmatory Factor Analyses

Comparing second-order model with alternative models. As shown in Table II.33, the proposed second-order model yielded adequate fit indices, while the one-factor model yielded poor fit statistics. A bifactor model also was tested, but failed to converge. When a three-factor model was tested, each of the fit indices for this model was the same as the second-order model because the model was just identified. As the total scores of school engagement based on the three subscale scores were used, the second-order model was selected as the final model.

Table II.33

Fit Statistics for Models Tested (DSES-S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	18,894.02*	55	.895	.109	.145
Three-factor model	2,014.443*	41	.996	.033	.054
Second-order model	2,014.443*	41	.996	.033	.054

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =16,206. Models were tested on approximately one half of sample, randomly selected.
*p <.001

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: χ^2 = 1959.24 (41, *N* =16,206), $p < .001$; CFI = .992, RMSEA = .054, and SRMR = .032. The completely standardized factor loadings were also compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table II.34, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table II.35.

Table II.34						
Confirmatory Factor Analysis of the Second-order Model of DSES-S						
	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: School Engagement						
Behavioral Engagement	.97	.01	117.37	.97	.01	111.79
Cognitive Engagement	.98	.01	113.12	.98	.01	116.56
Emotional Engagement	.59	.01	5.50	.59	.01	48.90
First-order Factor 1: Behavioral Engagement						
1. I pay attention in class.	.74	.01	98.25	.73	.01	93.26
4. I follow the rules at school.	.80	.01	117.89	.79	.01	106.75
7. When I don't do well, I work harder.	.67	.01	88.31	.68	.01	88.41
10. I stay out of trouble at school.	.70	.01	76.55	.70	.01	58.87
First-order Factor 2: Cognitive Engagement						
2. I try my best in school.	.75	.01	108.81	.75	.01	112.52
5. I turn in my homework on time.	.70	.01	75.82	.69	.01	79.83
8. I get good grades in school.	.67	.01	76.20	.67	.01	68.16
First-order Factor 3: Emotional Engagement						
3. I feel happy in school.	.84	.01	166.36	.83	.00	198.62
6. My school is a fun place to be.	.87	.00	241.50	.87	.00	235.41
9. I like students who go to this school.	.66	.01	63.91	.67	.01	65.72
12. I like this school.	.87	.00	208.57	.87	.01	187.36
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table II.35						
Fit Statistics Between Groups for Second-order Model (DSES-S)						
Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	32,412	3790.31*	41	.979	.032	.053
Elementary	15,096	1272.78*	41	.973	.033	.045
Middle	10,805	1806.53*	41	.966	.034	.063
High	6,511	1245.73*	41	.932	.037	.067
Male	15,945	2197.52*	41	.980	.035	.057
Female	16,467	1943.96*	41	.980	.031	.053
White	15,222	1935.70*	41	.979	.031	.055
Black	8,448	1143.96*	41	.967	.038	.056
Hispanic/Latino	4,178	537.48*	41	.981	.034	.054
Asian	1,198	94.64*	41	.990	.026	.033
Multi-Racial	3,366	422.38*	41	.972	.032	.053

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle and high schools yielded fit statistics that suggested adequate model fit (see Table II.36). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 319.32 (Δdf = 16), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 254.63 (Δdf = 4), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler scaled chi-square difference test = 0.05 (Δdf = 6), p = *ns*, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 0.03 (Δdf = 5), p = *ns*, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female students yielded fit statistics that suggested adequate model fit (see Table II.36). The difference between test statistics for the invariance of first-order factor loadings (Model 2)

and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 138.18 (Δdf = 8), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 12.11 (Δdf = 2), $p < .01$, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 0.05 (Δdf = 6), $p = ns$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 0.03 (Δdf = 5), $p = ns$, ΔCFI < .01.

Measurement invariance across race/ethnicity. A model testing the configural invariance across White, Black, and Hispanic/Latino students yielded fit statistics that suggested adequate model fit (see Table II.36). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 68.62 (Δdf = 15), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 35.47 (Δdf = 4), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 0.04 (Δdf = 6), $p = ns$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 0.02 (Δdf = 5), $p = ns$, ΔCFI < .01.

Table II.36

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DSES-S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels (Across Middle and High Schools)					
Model 1	4,340.93*	125	.961	.034	.056
Model 2	4,667.94*	141	.958	.037	.055
Model 3	4,915.00*	145	.965	.044	.046
Model 4	4,353.76*	159	.956	.044	.055
Model 5	3,937.52*	164	.961	.044	.049
Gender group					
Model 1	4,150.66*	83	.995	.033	.055
Model 2	4,321.90*	91	.995	.035	.054
Model 3	4,324.51*	93	.995	.035	.053
Model 4	4,388.59*	100	.995	.035	.051
Model 5	4,287.26*	102	.995	.035	.050
Race/Ethnicity group					
Model 1	3,628.45*	125	.983	.034	.055
Model 2	3,722.01*	141	.985	.035	.052
Model 3	3,764.94*	145	.985	.036	.052
Model 4	3,758.86*	159	.985	.036	.049
Model 5	3,633.39*	164	.986	.036	.048

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.

*p <.001

Correlations among Factors

For all students combined, cognitive engagement correlated .73 with behavioral engagement and .48 with emotional engagement. Behavioral engagement correlated .50 with emotional engagement.

Reliability

As shown in Table II.37, for all students combined across grade levels, internal consistency coefficients were .75 for Cognitive Engagement, .81 for Behavioral Engagement, .88 for Emotional Engagement, and .89 for Total Engagement. The alpha coefficients for each of the three subscales and total scale also was computed for each subgroup (5 racial–ethnic groups x 2 genders x 3 grade levels), and ranged from = .63 to .90.

Table II.38 shows reliability coefficients for grades 3-12. As can be seen, all coefficients ranged from = .63 to .89, with the lowest (.63) being in grade 3 for Cognitive Engagement). The lowest coefficients were for cognitive engagement at grades 3, 4, and 5. *For this reason, caution is warranted in interpreting results for this subscale in elementary schools, and those schools might want not to include that subscale.* If included, it is recommended that the survey be read aloud, as we suspect that some students find it difficult to read and understand all items on this scale, and especially certain subscales.

Table II.37

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DSES-S)

	Cognitive Engagement	Behavioral Engagement	Emotional Engagement	Total Engagement
Full Sample	.75	.81	.88	.89
Grade Level				
Elementary	.65	.79	.85	.87
Middle	.76	.83	.87	.89
High	.78	.80	.88	.87
Gender				
Boys	.75	.80	.87	.89
Girls	.74	.81	.89	.89
Race/Ethnicity				
White	.77	.82	.89	.90
Black	.71	.79	.87	.88
Hispanic/ Latino	.73	.81	.89	.90
Asian	.76	.83	.89	.89
Multi-Racial	.73	.81	.88	.89

Table II.38				
Reliability Coefficients by Grade (DSES-S)				
Grade	Cognitive Engagement	Behavioral Engagement	Emotional Engagement	Total Engagement
Third	.63	.77	.82	.87
Fourth	.64	.79	.85	.87
Fifth	.69	.80	.86	.88
Sixth	.75	.83	.87	.89
Seventh	.76	.83	.87	.88
Eighth	.78	.82	.87	.88
Ninth	.76	.80	.87	.88
Tenth	.78	.81	.88	.88
Eleventh	.79	.78	.87	.87
Twelfth	.78	.82	.88	.87

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table II.39. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table II.40 shows those scores as a function of grades 3-12.

A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in subscale scores. Results of the MANOVA found statistically significant differences for each main effect and for all two-way interaction effects. The three-way interaction was not significant. Because most effect sizes were very small, and thus of little practical value, only those mean differences and interactions that were both statistically significant and practically meaningful are reported. Partial eta squared statistics were .047 for grade level, .008 for race/ethnicity, and .013 for gender, with no interactions exceeding .013. Thus, only grade level differences are reported here.

The combined dependent variables were significantly related to grade level, F (6, 64272), $p <$ .001, partial $\eta 2 = .047$. For individual subtests, grade level differences also were statistically significant (all ps $< .001$) and meaningful for two of the three subscales: Cognitive Engagement, $F = 740.61$, partial $\eta 2 = .044$; and Emotional Engagement, $F = 1357.92$, partial $\eta 2 = .078$. Grade level differences were statistically significant, but practically meaningful: Behavioral Engagement, $F = 302.76$, partial $\eta 2 = .018$.

Follow-up comparisons in grade level differences using the Bonferroni method showed that compared to other grade levels, scores of elementary students were higher than those of middle and high school students on all three subscales. Additionally, middle school students reported higher scores than high school students (all p's $< .001$).

Table II.39

Means and Standard Deviations for Subscale and Scale Scores by Grade Level, Gender, and Race/Ethnicity (DSES-S)

		Cognitive Engagement		Behavioral Engagement		Emotional Engagement		Total Engagement	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Elementary									
Boys	7748	3.46	0.51	3.38	0.54	3.28	0.69	3.36	0.49
Girls	7586	3.58	0.46	3.56	0.49	3.39	0.65	3.50	0.49
Black	3874	3.43	0.54	3.36	0.57	3.24	0.72	3.34	0.51
White	7000	3.57	0.46	3.52	0.49	3.37	0.66	3.48	0.46
Hispanic	2002	3.47	0.47	3.48	0.50	3.38	0.63	3.44	0.46
Asian	556	3.63	0.43	3.59	0.46	3.50	0.54	3.57	0.40
Multi Racial	1602	3.51	0.48	3.45	0.51	3.30	0.69	3.40	0.46
Total	15034	3.52	0.49	3.47	0.52	3.34	0.67	3.43	0.47
Middle									
Boys	5271	3.19	0.59	3.23	0.56	2.86	0.74	3.09	0.53
Girls	5443	3.31	0.58	3.33	0.56	2.77	0.80	3.12	0.54
Black	2722	3.15	0.58	3.17	0.56	2.75	0.77	3.01	0.52
White	5011	3.33	0.58	3.35	0.54	2.83	0.78	3.16	0.53
Hispanic	1433	3.18	0.55	3.28	0.54	2.90	0.72	3.11	0.51
Asian	364	3.53	0.54	3.52	0.52	3.02	0.71	3.34	0.51
Multi Racial	1184	3.17	0.62	3.18	0.61	2.71	0.80	3.00	0.56
Total	10714	3.25	0.59	3.28	0.56	2.81	0.77	3.10	0.53
High									
Boys	3116	3.02	0.59	3.16	0.52	2.71	0.72	2.96	0.51
Girls	3303	3.20	0.57	3.29	0.50	2.56	0.76	3.00	0.49
Black	1751	3.08	0.55	3.20	0.50	2.66	0.71	2.97	0.47
White	3121	3.14	0.61	3.25	0.52	2.61	0.76	2.99	0.51
Hispanic	722	3.03	0.59	3.22	0.50	2.63	0.73	2.95	0.50
Asian	274	3.34	0.54	3.37	0.46	2.80	0.71	3.15	0.45
Multi-Racial	551	3.02	0.56	3.18	0.51	2.58	0.77	2.92	0.50
Total	6419	3.11	0.59	3.23	0.51	2.63	0.74	2.98	0.50

Table II.40

Means and standard deviations for subscale and scale scores for grades 3-12, (DSES-S)

		Cognitive Engagement		Behavioral Engagement		Emotional Engagement		Total Engagement	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
3	5214	3.55	0.48	3.50	0.52	3.45	0.62	3.50	0.46
4	5289	3.53	0.48	3.48	0.52	3.34	0.67	3.44	0.47
5	5061	3.47	0.50	3.42	0.52	3.18	0.72	3.35	0.49
6	3633	3.32	0.57	3.31	0.57	2.94	0.75	3.18	0.53
7	3350	3.22	0.59	3.27	0.55	2.79	0.76	3.08	0.52
8	3201	3.19	0.60	3.24	0.56	2.66	0.78	3.01	0.53
9	1787	3.09	0.60	3.21	0.53	2.72	0.73	3.00	0.52
10	1669	3.10	0.58	3.20	0.51	2.63	0.74	2.97	0.50
11	1685	3.11	0.59	3.25	0.49	2.57	0.74	2.97	0.49
12	1278	3.15	0.58	3.28	0.51	2.58	0.74	2.99	0.49

Concurrent Validity

Table II.41 shows correlations of Delaware Student Engagement Scale scores (aggregated at the school level) with academic achievement and suspensions/expulsions.

Table II.41

Correlations between DSES-S and Academic Achievement and Suspensions/Expulsions

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Cognitive Engagement	.664**	.658**	-.520**	.639**	.617**	-.560**	.261	.496*	-.589**
Behavioral Engagement	.638**	.625**	-.564**	.662**	.639**	-.752**	-.054	.184	-.530*
Emotional Engagement	.574**	.522**	-.575**	.633**	.580**	-.655**	-.132	-.036	-.511*
Total Engagement	.670**	.638**	-.612**	.694**	.652**	-.712**	.018	.242	-.659**

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n =76 schools, [b] n = 28 schools, [c] n = 18 schools,
*p < .05. **p < .01, ***p < .001. One tailed.

Delaware Social and Emotional Competency Scale (DSECS)

The same methods used for the DSCS-S, DBVS-S and DSES-S, as presented above, were used for the DSECS. This included testing of a proposed second-order model consisting of a four lower-order factors and a higher-order factor.

Confirmatory Factor Analyses Results

Consistent with the scale's composition of four subscales, a second-order model with one high order factor (social-emotional competencies) and four lower order factors was first tested. The four first-order factors are *responsible decision making, relationship skills, self-management,* and *social awareness*. Two other comparison models were tested as alternative models: a one-factor model and four-factor model.

Comparing second-order model with alternative models. As shown, in Table II.42, the proposed second-order model yielded adequate fit indices, while the one-factor model yielded poor fit statistics. The bifactor model failed to converge. When a four-factor correlation model and the nested second-order model were compared, the Satorra–Bentler scaled chi-square difference test = 357.52 (Δdf =2), $p < .001$ indicated that four-factor model had a significantly better fit than the second-order model. However, considering that second-order model is more consistent the theoretical framework of Social Emotional Learning Competencies recognized by the Consortium for Academic, Social, and Emotional Learning (CASEL) and the fact that the fit indexes (CFI, SRMS, and RMSEA) of second-order model indicated adequate model fit, the second-order model was chosen as the final model.

Table II.42

Fit Statistics for Models Tested (DSECS-S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	4,510.62*	54	.853	.045	.072
Four-factor correlation model	924.32*	48	.971	.024	.034
Second-order model	1,357.93*	50	.957	.030	.040

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =16,205. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: χ^2 = 1380.51 (50, *N* =16,205), $p < .001$; CFI = .959, RMSEA = .041[.039, .043], and SRMR = .029. As seen in Table II.43, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full

sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table II.44.

Table II.43

Confirmatory Factor Analysis of the Second-order Model (DSECS-S)

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: Social Emotional Competency						
Responsible Decision Making	.98	.01	124.08	.99	.01	136.79
Social Awareness	.71	.01	77.72	.71	.01	83.61
Self-Management	.96	.01	131.89	.96	.01	13.02
Relationships Skills	.92	.01	81.77	.91	.01	99.34
First-order Factor 1: Responsible Decision Making						
1. I blame others when I'm in trouble.	.34	.01	29.47	.34	.01	27.04
5. I feel responsible for how I act.	.68	.01	72.44	.70	.01	8.69
9. I am good at deciding right from wrong.	.69	.01	65.67	.69	.01	69.34
First-order Factor 2: Social Awareness						
2. I think about how others feel.	.79	.01	121.41	.78	.01	11.62
6. I care about how others feel.	.86	.01	155.07	.85	.01	153.44
10. What others think is important to me.	.40	.01	41.39	.40	.01	43.23
First-order Factor 3: Self-Management						
3. I can control how I behave.	.62	.01	54.88	.62	.01	6.19
7. I think before I act.	.71	.01	103.30	.70	.01	101.48
11. I am good at waiting for what I want.	.55	.01	59.72	.55	.01	68.32
First-order Factor 4: Relationships						
4. I am good at solving conflicts with others.	.62	.01	74.47	.62	.01	73.71
8. I get along well with others.	.65	.01	73.88	.65	.01	63.21
12. I have one or more close friends.	.40	.02	26.67	.40	.02	26.37

Note. Loading = standardized factor loading; SE = standard error; z = robust z score.

Table II.44						
Fit Statistics Between Groups for Second-order Model (DSECS-S)						
Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	32,157	2,790.66	50	.965	.030	.041
Elementary	14,935	1,125.54	50	.964	.028	.038
Middle	10,736	1,236.23	50	.963	.033	.047
High	5,176	966.97	50	.950	.037	.053
Male	15,795	1,664.24	50	.954	.033	.045
Female	16,362	1,28.66	50	.969	.028	.039
White	15,147	1,428.88	50	.962	.031	.043
Black	8,348	857.73	50	.954	.032	.044
Hispanic/Latino	4,142	417.85	50	.964	.031	.042
Asian	1,191	144.53	50	.970	.031	.040
Multi-Racial	3,329	266.47	50	.970	.028	.036
Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.						

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table II.45). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 145.06 ($\Delta df = 16$), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 24.24 ($\Delta df = 6$), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance of first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler scaled chi-square difference test = 0.00 ($\Delta df = 4$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 0.06 ($\Delta df = 7$), p = ns, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female students yielded fit statistics that suggested adequate model fit (see Table II.45). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 10.83 (Δdf =

8), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 2.14 (Δdf = 3), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 0.27 (Δdf = 8), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 0.01 (Δdf = 3), p = ns, ΔCFI < .01.

Measurement invariance across race/ethnicity. A model testing the configural invariance across White, Black, and Hispanic/Latino students yielded fit statistics that suggested adequate model fit (see Table II.45). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 7.55 (Δdf = 16), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 5.05 (Δdf = 6), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 0.01 (Δdf = 4), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 0.01 (Δdf = 7), p = ns, ΔCFI < .01.

Table II.45

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DSECS-S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	3,314.59*	150	.954	.031	.044
Model 2	3,412.35*	166	.952	.034	.043
Model 3	3,447.83*	172	.952	.035	.042
Model 4	3,767.62*	188	.947	.035	.042
Model 5	3,907.55*	195	.945	.035	.042
Gender group					
Model 1	2,714.88*	100	.956	.030	.040
Model 2	2,774.55*	108	.955	.031	.039
Model 3	2,777.01*	111	.955	.032	.039
Model 4	2,976.66*	119	.952	.032	.039
Model 5	3,051.51*	122	.951	.032	.039
Race/Ethnicity group					
Model 1	2,540.23*	150	.956	.031	.042
Model 2	2,625.86*	166	.955	.033	.040
Model 3	2,676.14*	172	.954	.034	.040
Model 4	2,924.22*	188	.950	.034	.040
Model 5	3,032.83*	195	.948	.034	.040

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Correlations Among Factors

For all students combined, responsible decision making correlated .52 with relationship skills, .63 with self-management, .44 with social awareness, and .79 with the total score. Relationship skills correlated .53 with self-management, .51 with social awareness, and .79 with the total score. Self-management correlated .47 with social awareness and .82 with the total score. Social awareness correlated .78 with the total score. All correlations were significant at the .001 level.

Reliability

As shown in Table II.46, internal consistency coefficients for the total score ranged from .78 to .82 across gender, grade, and racial/ethnic groups. For all students combined at grade levels, the alpha coefficients were .78 for elementary students, .80 for middle school students, and .82 for high school students.

For separate subscales, which consisted of only three items each, alpha coefficients ranged from .54 to .73 across grade levels. Because most coefficients were below the minimally accepted criterion of .70, it is not recommended that scores be used for the four subscales. Thus, they are not reported.

Table II.47 shows reliability coefficients for the total score for grades 3-12. As can be seen, all coefficients ranged from = .77 to .83.

Table II.46

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DSECS-S)

	Total DSECS Score
Full Sample	.80
Grade Level	
Elementary	.78
Middle	.80
High	.82
Gender	
Male	.80
Female	.79
Race/Ethnicity	
White	.79
Black	.80
Hispanic/Latino	.80
Asian	.82
Multi-Racial	.79

Table II.47	
Reliability Coefficients by Grade (DSECS-S)	
Grade	**Total DSECS Score**
Third	.78
Fourth	.77
Fifth	.79
Sixth	.80
Seventh	.78
Eighth	.81
Ninth	.83
Tenth	.83
Eleventh	.80
Twelfth	.80

Means and Standard Deviations

Means and standard deviations for the total score at the student level across grade level, racial/ethnic group, and gender are shown in Table II.48. Scores are the average item scores for items on the total scale (i.e., sum of scores divided by number of items, which was 12). Table II.49 shows those scores as a function of grades 3-12.

A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) analysis of variance ANOVA was conducted to test differences between groups in scores. Results of the ANOVA found statistically significant differences and small effect sizes for grade level, $F(2, 30180) = 229.45$, $p < .001$, partial eta squared = .015, and for and race/ethnicity, $F(2, 30180) = 155.00$, $p < .001$, partial eta squared = .02. Although gender differences and the interaction effects for grade level x race were statistically significant at the .001 level, the effect sizes were below .01 (.009 for gender and .001 for grade level x race), and thus not practically meaningful. The gender x race interaction was statistically significant at the .01 level, but of not practically meaningful (partial eta squared = .000). No other effects were significantly significant at the .01 level.

Follow-up comparisons of grade level differences, using the Bonferroni method, showed that compared to other grade levels scores of elementary students were significantly higher ($p < .001$) than those of middle and high school students.

Follow-up comparisons in racial/ethnicity differences, using the Bonferroni method, showed that Black students scored lower than all other groups, whereas Asian and white students scored significantly higher ($p < .001$). Scores between White and Asian students were not statistically significant. Whereas Hispanic and Multi-racial/Other students scored lower than Asian and Caucasian students, the two groups did not differ in their scores.

Table II.48

Means and Standard Deviations for Total Scale Scores by Grade Level, Gender, and Race/Ethnicity for Delaware Social-Emotional Competencies Scale (DSECS-S)

		Total DSECS Score	
	N	Mean	SD
Elementary			
Boys	6842	3.35	0.47
Girls	7059	3.50	0.44
White	6581	3.48	0.43
Black	3480	3.34	.051
Hispanic/Latino	1852	3.42	0.48
Asian	520	3.51	0.42
Multi-Racial	1468	3.39	0.47
Total	13901	3.43	0.46
Middle			
Boys	4957	3.20	0.49
Girls	5196	3.32	0.48
White	4799	3.33	0.45
Black	2546	3.14	0.51
Hispanic/Latino	1358	3.23	0.47
Asian	345	3.41	0.44
Multi-Racial	1105	3.19	0.52
Total	10153	3.27	0.48
High			
Boys	2971	3.20	0.49
Girls	3185	3.35	0.46
White	3031	3.33	0.46
Black	1646	3.20	0.50
Hispanic/Latino	685	3.22	0.50
Asian	267	3.35	0.46
Multi-Racial	527	3.20	0.49
Total	6156	3.27	0.48

Table II.49			
Means and Standard Deviations for Total Scale Scores for grades 3-12, Delaware Social-Emotional Competencies Scale (DSECS-S)			
		Total DSECS Score	
	N	Mean	SD
Grade			
Third	4764	3.46	0.47
Fourth	4885	3.43	0.45
Fifth	4752	3.38	.047
Sixth	3413	3.30	0.49
Seventh	3195	3.25	0.47
Eighth	3045	3.21	0.49
Ninth	1714	3.21	0.51
Tenth	1589	3.24	0.50
Eleventh	1636	3.31	0.45
Twelfth	1217	3.36	0.45

Concurrent Validity

As evidence supporting the validity of scores for the purposes intended, the degree to which the total DSECS score correlated with several valued outcomes was examined. First, we examined correlations with students' scores on subscales of the Delaware Student Engagement Scale and the total score. Theoretically, one should expect social-emotional competencies to correlate highly with engagement, especially behavioral engagement, which includes the following items:

#1. I pay attention in class.
#4. I follow the rules at school.
#7. When I don't do well, I work harder.
#10. I stay out of trouble at school.

Second, at the school-level we examined the extent to which the total DSECS score correlated with academic achievement (i.e., English Language Arts and Math) and school suspensions (see pp. 39 for description of those measures). For those correlations, data were aggregated at the school level. Because of the small number of high schools (n = 18), we combined middle (n = 27) schools. This decision was supported by the finding that DSECS scores did not between students in high school and middle school.

Tables II.50 and II.51 show results of the correlational analyses.

Table II.50

Correlations Between Total DSECS-S Score and Student Engagement Scores (DSES-S)

	Total DSECS-S Score
Elementary School Students *(n* = 13901)	
Behavioral Engagement	.59
Cognitive Engagement	.47
Emotional Engagement	.48
Total Engagement Score	.62
Middle School Students *(n* = 10153)	
Behavioral Engagement	.62
Cognitive Engagement	.51
Emotional Engagement	.40
Total Engagement Score	.60
High School Students *(n* = 6165)	
Behavioral Engagement	.51
Cognitive Engagement	.40
Emotional Engagement	.24
Total Engagement Score	.45
All Students Combined *(n* = 30210)	
Behavioral Engagement	.60
Cognitive Engagement	.48
Emotional Engagement	.43
Total Engagement Score	.59

Note. $p < .001$ one-tailed.

Table II.51

Correlations Between Total DSECS-S Score with Academic Achievement and Suspensions (School Level)

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Total DSECS-S Score	.687**	.645**	-.598**	.811**	.801**	-.755**	.173	.420*	-.542*

Note. [a]*n* =76 schools, [b]*n* = 28 schools, [c]*n* = 18 schools,
*$p < .05$. **$p < .01$, ***$p < .001$ One tailed.

CHAPTER 3
VALIDITY AND RELIABILITY OF SCALES OF THE DELAWARE SCHOOL SURVEY—TEACHER/STAFF

The teacher/staff version of the Delaware School Surveys consists of two separate scales: *Delaware School Climate Survey – Teacher/Staff (DSCS−T/S) and the Delaware Positive, Punitive, and SEL Techniques Scale – Teacher/Staff (DTS−T/S).* In this chapter we present evidence of the validity and reliability of scores on each of those scales.

Delaware School Climate Scale– Teacher/Staff (DSCS−T/S)

The development of the *DSCS−T/S* and evidence of validity and reliability of its scores are presented in a research article by Bear, Yang, Pell, and Gaskins entitled "Validation of a Brief Measure of Teachers' Perceptions of School Climate: Relations to Student Achievement and Suspensions," which was published in *Learning Environments Research* (Volume *17*, 2014). That study was conducted on the 2007 version of the survey, with the CFA conducted on 5,781 teachers, support staff, administrators and other staff in 132 schools. Results showed that a bifactor model consisting of seven specific factors best represented the data. Those factors were Teacher–Student Relations, Student–Student Relations, Teacher–Home Communication, Respect for Diversity, School Safety, Fairness of Rules, and Clarity of Expectations. Measurement invariance was found across grade levels (i.e., elementary, middle, and high schools) and subgroups of respondents (i.e., teachers, instructional support staff and non-instructional staff). As evidence of concurrent validity across grade levels, nearly all scores, aggregated at the school level and correlated significantly and negatively with suspensions/expulsion rates and positively with academic achievement. Since then, the DSCS-S has been revised. Version 1 of the *DSCS Technical Manual* documented the evidence of the 2011 surveys.

The DSCS-T/S now consists of 39 items supported by CFA results. As described in Chapter 1, six aspects of school climate are assessed by 24 items that are shared by the student, teacher/staff, and home versions of the surveys: Teacher–Student Relations (5 items), Student–Student Relations (5 items), Clarity of Expectations (4 items), Fairness of Rules (4 items), and School Safety (3 items). Four additional items on the Teacher/Staff (and Home) version assess Teacher-Home Communications. On the teacher/staff version (and student version), four items assess Student-Engagement School-wide and four items assess Bullying School-wide. Additionally, four items on the teacher/staff version, not found on the other two versions, assess Teacher-Staff Relations. Research and theory supporting the ten factors of the DSCS-T/S were presented in Chapter 1. The purpose of this chapter is to present results of CFA conducted on the 2015 DSCS-T/S, as well as additional evidence of validity and reliability of its scores.

Participants

As shown in Table III.1, the 2015 sample consisted of 5,086 respondents: 3,540 teachers, 810 support staff (e.g., specialists, school counselors, school psychologists, librarians), 185 building-level administrators, and 551 "other" staff (e.g., paraprofessionals, cafeteria workers, custodians) in 126 public schools in the state of Delaware. Among them, 2,810 were in 79 elementary schools (predominantly K-3, 3-5, and K-5 configurations), 1,184 in 28 middle schools

(predominantly grades 6-8), and 1,092 in 19 high schools (grades 9-12). The sample represented 61% of public elementary, middle, and high schools and 38% of teachers in all Delaware public schools. Charter schools were included that served the general population (i.e., not special education or alternative schools).

The 126 schools volunteered to administer the teacher survey via computer upon an invitation from the Delaware DOE in a letter sent to each school district office. In return for their participation, each school was given a report of the results. To ensure confidentiality, and as requested by the DOE, no information was collected that could be used to potentially identify a respondent. Thus, respondents were not asked to reveal their name, gender, ethnicity/race, or grade level.

Table III.1.

Demographic Information for the Teacher/Staff Sample (DSCS−T/S)

	Grade Level							
	Elementary		Middle		High		Full Sample	
	N	%	N	%	N	%	N	%
Positions								
Teacher	1852	65.9	869	73.4	819	75.0	3540	69.6
Support Staff	511	18.2	167	14.1	132	12.1	810	15.9
Other Staff	347	12.3	104	8.8	100	9.2	551	10.8
Administrator	100	3.6	44	3.7	41	3.8	185	3.6
Gender								
Female	2531	90.1	905	76.4	693	63.5	4129	81.2
Male	279	9.9	279	23.6	399	36.5	957	18.8
Total	2810		1184		1092		5086	

Confirmatory Factor Analyses

In conducting CFA for the DSCS-T/S, the same statistical procedures used in analyzing the DSCS-S, as detailed in Chapter 2, were followed. This included group mean centering, thereby producing ICCs of zero for each item. This was done given that the ICCs on the factor scores in elementary schools ranged from .14 (Teacher-Student Relationships factor) to .37 (School-wide Engagement) and the ICC on the total school climate score was .32.

Based on preliminary exploratory and confirmatory factor analyses (CFA), three items on the Respect for Diversity Factor were deleted from further analyses due to poor factor loadings. The three items deleted were:

#12. Adults care about students of all races.
 # 26. Students of different races get along
#27. Teachers expect the best from students of all races.

Two additional items on that original factor were moved to another factor. The item "*Teachers treat students of all races with respect*" was moved to Teacher-Student Relationships and "*Students respect others who are different"* was moved to Student-Student Relationships. As a result of these preliminary analyses, the model consisted of nine factors.

Results of Confirmatory Factor Analyses

Comparing nine-factor model with alternative models. As shown in Table III.2, a nine-factor model yielded the best fit indices; however, two other models had adequate fit, with very good SRMS and RMSEA indices and the CFI close to the criteria of .95 (note that CFI above .90 is often considered acceptable, and especially in combination with low SMSR and RMSEA values, as were found; Brown, 2015). A one-factor model (the most parsimonious of the three alternative models) yielded poor fit statistics.

When the nine-factor model and the nested second-order model were compared, the Satorra–Bentler scaled chi-square difference test = 1459.61 ($\Delta df = 27$), $p < .001$ indicated that nine-factor model had a significantly better fit than the second-order model. The Akaike Information Criterion (AIC) values from the nine-factor model (AIC = 102,422.21) and the bifactor model (AIC = 103,605.05) were compared, the nine-factor model had a lower AIC value than the bifactor model. Considering the lower AIC value and better fit indexes (CFI, SRMS, and RMSEA) of the nine-factor model than the three alternative models, the nine-factor model was chosen as the final model.

Table III.2

Fit Statistics for Models Tested (DSCS-T/S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	20,744.33*	702	.549	.098	.106
Nine-factor correlation model	3,905.96*	666	.927	.043	.044
Second-order model	5,488.51*	693	.892	.069	.052
Bifactor model	6,368.79*	671	.872	.202	.058

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s = 2,543. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly selected half of the sample also generated robust fit statistics for the nine-factor model: $\chi^2 = 5488.51$ (666, $N = 2,543$), $p < .001$; CFI = .927, RMSEA = .044, and SRMR = .044. Completely standardized factor loadings were also compared to ensure that there were no large differences between the randomly split samples. As illustrated in Table III.3, indicators demonstrated similar factor loadings on the nine factors in both halves of the sample. As no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent

analyses were run with the full sample. A summary of the fit statistics for the nine-factor model with full sample and subsamples is presented in Table III.4. Because the subgroups of administrators, Hispanic teachers, and teachers with other race/ethnicity achieved poor model fit, the administrator group was excluded in the measurement invariance test. In addition, the model of subgroup of Asian teachers did not converge; thus, the Asian group also was excluded.

Table III.3

Confirmatory Factor Analysis of Nine-factor Model (DSCS-T/S)

	Sample 1			Sample 2		
Factor and Items	Loading	*SE*	*z*	Loading	*SE*	*z*
Teacher-Student Relations						
2. Teachers treat students of all races with respect.	.65	.02	40.35	.77	.01	91.85
7. Teachers care about their students.	.77	.02	49.74	.81	.01	136.60
17. Teachers listen to students when they have problems.	.74	.01	57.13	.80	.01	130.53
22. Adults who work here care about the students.	.84	.01	76.64	.83	.01	149.71
32. Teachers like their students.	.70	.02	46.42	.83	.01	125.54
Student-Student Relations						
11. Students are friendly with each other.	.78	.01	61.32	.79	.01	106.11
16. Students care about each other.	.79	.01	65.25	.84	.01	126.35
21. Students respect others who are different.	.71	.02	43.63	.79	.01	121.88
30. Students treat each other with respect.	.84	.01	87.87	.90	.01	181.67
31. Students get along with each other.	.83	.01	70.91	.90	.01	166.42
Clarity of Expectations						
5. Rules are made clear to students.	.78	.01	62.88	.81	.01	82.58
10. Students know how they are expected to act.	.75	.02	48.97	.84	.01	103.80
15. Students know what the rules are.	.82	.02	55.74	.88	.01	138.03
20. It is clear how students are expected to act.	.85	.01	90.90	.89	.01	148.15
Fairness of Rules						
3. The school rules are fair.	.72	.01	50.69	.81	.01	119.08
8. The consequences of breaking rules are fair.	.65	.02	37.33	.77	.01	74.43

18. The school's Code of Conduct is fair.	.70	.02	38.14	.85	.01	113.71
28. Classroom rules are fair.	.72	.02	43.00	.85	.01	117.38
Safety						
4. Students are safe in the hallways.	.69	.02	44.81	.76	.01	78.24
13. Students feel safe.	.84	.01	66.23	.89	.01	163.32
19. Students know they are safe.	.87	.01	93.46	.91	.00	207.21
School-wide Bullying						
9. Students threaten and bully others.	.77	.02	43.13	.76	.02	48.48
14. Students worry about others bullying them.	.69	.02	40.90	.65	.02	27.73
24. Bullying is a problem.	.80	.01	62.15	.81	.01	63.24
33. Students bully one another.	.81	.02	43.17	.82	.02	49.26
School-wide Engagement						
1. Most students turn in their homework on time.	.44	.02	24.69	.42	.02	21.33
6. Most students try their best.	.63	.01	44.97	.62	.02	42.05
23. Most students follow the rules.	.70	.02	44.59	.71	.02	46.46
25. Most students like this school.	.74	.01	51.51	.74	.02	50.56
29. Most students work hard to get good grades.	.69	.02	46.86	.70	.02	46.59
34. Most students feel happy.						
Teacher-Home Communication						
35. Teachers work closely with parents to help students when they have problems.	.71	.02	46.13	.70	.02	46.08
37. Teachers do a good job communicating with parents.	.79	.01	72.82	.77	.01	62.90
39. Teachers show respect toward parents.	.85	.01	70.99	.86	.01	82.23
41. Teachers listen to the concerns of parents.	.88	.01	88.62	.89	.01	111.91
Staff Relations						
36. Teachers, staff, and administrators function as a good team.	.90	.01	117.39	.90	.01	128.00
38. There is good communication among teachers, staff, and administrators.	.86	.01	113.92	.86	.01	110.58
40. Teachers, staff, and administrators	.95	.00	225.76	.95	.00	256.18

work well together.						
42. Administrators and teachers support one another.	.90	.01	152.52	.88	.01	106.74
Note. Loading = standardized factor loading; *SE* = standard error; *z* = robust *z* score.						

Table III.4

Fit Statistics Between Groups for Nine-factor Model (DSCS-T/S)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	5,086	6954.47*	666	.927	.042	.043
Elementary	2,810	4 580.53*	666	.925	.042	.046
Middle	1,184	2114.69*	666	.928	.048	.043
High	1,092	2174.42*	666	.920	.048	.046
Males	957	1842.78*	666	.924	.051	.043
Females	4,129	5850.74*	666	.927	.041	.043
White	4,278	6,103.66*	666	.926	.041	.044
Black	539	1,266.57*	666	.917	.050	.041
Hispanic	114	1,556.05*	666	.600	.089	.108
Other Race-Ethnicity	120	1,347.00*	666	.618	.100	.092
Teachers	3,540	5028.48*	666	.925	.042	.043
Administrators	185	1099.46*	666	.789	.09	.059
Support Staff	810	1487.86*	666	.939	.042	.039
Other	551	1278.57*	666	.930	.048	.041

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across grade level. A test of the configural invariance of the student climate model across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table III.5). The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated weak factorial invariance across grade level: Satorra–Bentler scaled chi-square difference test = 173.25 (Δdf = 60), p <.001, ΔCFI = .000, ΔRMSEA = -.001, ΔSRMR = .002. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, strong measurement invariance was found across grade level: Satorra–Bentler scaled chi-square difference test = 262.21 (Δdf = 60), p <.001, ΔCFI = - .003, ΔRMSEA = .000, and ΔSRMR = .000.

Measurement invariance across gender. A test of the configural invariance across gender indicated adequate model fit (see Table III.5). The weak factorial invariance model (Model 2) was nested within Model 1. The difference between test statistics for the two models indicated

that there was weak factorial invariance across gender: Satorra–Bentler scaled chi-square difference test = 37.00 (Δdf = 30), p = *ns*, ΔCFI = .000, ΔRMSEA = .002, ΔSRMR = -.001. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance in the starting point of origin for the subscale was found across grade level: Satorra–Bentler scaled chi-square difference test = 161.84 (Δdf = 30), p <.001, ΔCFI = - .003, ΔRMSEA = .000, and ΔSRMR = .000.

Measurement invariance across positions. A model testing the configural invariance across three different position groups (i.e., Teachers, Support Staff, and Others) yielded fit statistics suggesting adequate model fit (see Table II.5). Reports from administrators were excluded from the positiongroup measurement invariance analyses due to small sample size and poor model fit of this subgroups. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated weak factorial invariance across race-ethnicity: Satorra–Bentler scaled chi-square difference test = 70.21 (Δdf = 60), p = *ns*, ΔCFI = -.001, ΔRMSEA = -.001, and ΔSRMR = .000. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance was found across race: Satorra–Bentler scaled chi-square difference test = 218.56 (Δdf = 60), p < .001, ΔCFI = -.003, ΔRMSEA = .000, and ΔSRMR = .000.

Measurement invariance across race/ethnicity. A model testing the configural invariance across two different race/ethnicity groups (i.e., White and Black) yielded fit statistics suggesting adequate model fit (see Table II.5). Reports from subgroups with Hispanic, Asian and Other race/ethnicity backgrounds were excluded from the race/ethnicity group measurement invariance analyses due to small sample size and poor model fit of these subgroups. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated weak factorial invariance across race-ethnicity: Satorra–Bentler scaled chi-square difference test = 38.24 (Δdf = 30), p = *ns*, ΔCFI = .000, ΔRMSEA = -.001, and ΔSRMR = .001. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance was found across race: Satorra–Bentler scaled chi-square difference test = 149.22 (Δdf = 30), p < .001, ΔCFI = -.002, ΔRMSEA = .000, and ΔSRMR = .000.

Table III.5

Fit Statistics for Confirmatory Factor Analysis of Nine-factor Model Testing Measurement Invariance across Grade Levels, Gender, Positions, and Race/Ethnicity (DSCS-T/S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	8,828.47*	1998	.924	.044	.046
Model 2	8,983.59*	2058	.924	.046	.045
Model 3	9,245.51*	2118	.921	.046	.045
Gender					
Model 1	7,280.50*	1332	.928	.042	.043
Model 2	7,308.94*	1362	.928	.042	.042
Model 3	7,469.93*	1392	.927	.042	.042
Position (Teacher, Support Staff, and Other subgroups only)					
Model 1	7,453.18*	1998	.929	.043	.041
Model 2	7,512.70*	2058	.929	.043	.040
Model 3	7,731.73*	2118	.926	.043	.040
Race/Ethnicity (White and Black subgroups only)					
Model 1	6,760.70*	1,332	.926	.042	.042
Model 2	6,777.56*	1,362	.926	.043	.041
Model 3	6,926.85*	1,392	.924	.043	.041

Note. Model 1: Configural invariance. Model 2: Weak factorial invariance. Model 3: Strong factorial invariance. $\chi 2$= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Correlations among Factors

To examine the relative independence of scores for the nine subscales supported by the results of confirmatory factor analyses and the extent to which they assess the "school climate" construct, correlations among scores on each of the subscales were computed. For these analyses, and all other analyses that follow, we used manifest indicators of the factor (i.e., sum of raw scores of items on the derived subscales and total scale). As shown in Table III.6, for all teachers/staff combined, correlation coefficients among subscales ranged in strength of value (i.e., absolute value) from .34 to .80, with a median of .58. Those results indicate that 36% ($1 - .80^2 = .36$) to 88% ($1 - .34^2 = .88$) of the variance in each subscale score is independent of the scores on the other subscales.

Table III.6										
Correlational Coefficients between Subscale and Total Scale Scores for the Full Sample (DSCS−T/S)										
	1	2	3	4	5	6	7	8	9	10
1. Teacher–Student Relations										
2. Student–Student Relations	.50									
3. Student Engagement School-wide	.60	.77								
4. Clarity of Expectations	.55	.54	.60							
5. Fairness of Rules	.62	.54	.59	.74						
6. School Safety	.53	.71	.69	.64	.65					
7. Bullying School-wide	-.35	-.61	-.54	-.40	-.42	-.62				
8. Teacher-Home Communications	.73	.48	.55	.52	.56	.50	-.35			
9. Staff Relations	.49	.47	.51	.55	.56	.51	-.37	.54		
10. Total School Climate	.76	.81	.85	.79	.80	.83	-.67	.74	.73	
Note. Values in parentheses are coefficients of internal consistency (Cronbach's alpha) for each subscale. All correlations are significant at $p < .001$.										

Reliability

With respect to the reliability of DSCS−T/S scores (see Table III.7), for all respondents combined across grade levels, internal consistency coefficients ranged from .82 to .95. Among the reliability analyses computed across the three 3 grade levels and four positions, the median correlation coefficient was .89). There were negligible differences between the alpha coefficients for elementary school (range .82 to .96, median = .89), middle school (range .82 to .95, median = .87), and high school (range .81 to .95, median = .88) respondents; between teacher group (range .82 to .95, median = .89), support staff group (range .86 to .95, median = .90), administrators (.83 to .95, median = .90), and other position groups (range .85 to .95, median = .90). Across all subgroups, the lowest alpha coefficients were for Fairness and the highest were for Staff Relations.

For the total score of DSCS−T/S, consisting of the sum of raw scores on all items of the nine subscales (while reverse scoring items reflecting a negative climate), high reliability was found across grade-level, position, gender, and race/ethnicity groups (range .92 to .95, with overall alpha of .94 for all teachers/staff combined).

Table III.7

Reliability coefficients by grade level and position (DSCS−T/S)

	Teacher Student Relations	Student Relations	Safety	Clarity	Fair-ness	Engage-ment School-wide	Bullying School-wide	Teacher -Home Comm	Staff Relations	Total
Full Sample	.88	.91	.89	.90	.82	.88	.89	.90	.95	.94
Grade Level										
Elementary	.88	.91	.85	.90	.82	.86	.88	.91	.96	.94
Middle	.86	.90	.90	.87	.82	.84	.88	.87	.95	.93
High	.85	.89	.90	.88	.81	.86	.88	.86	.95	.92
Position										
Teacher	.86	.91	.89	.89	.82	.87	.89	.88	.95	.93
Administrator	.90	.91	.85	.93	.87	.89	.83	.91	.94	.95
Support Staff	.90	.92	.88	.91	.86	.88	.90	.92	.95	.94
Other	.89	.92	.90	.90	.85	.87	.88	.91	.95	.94
Gender										
Males	.87	.90	.90	.89	.81	.86	.87	.88	.96	.93
Females	.88	.92	.89	.90	.83	.88	.89	.90	.95	.94
Race/Ethnicity										
White	.87	.91	.89	.90	.83	.88	.89	.89	.95	.94
Black	.86	.91	.89	.88	.80	.85	.85	.89	.95	.93
Hispanic/Latino	.89	.89	.91	.87	.82	.89	.88	.91	.96	.94
Asian	.89	.94	.96	.91	.82	.93	.80	.85	.96	.95
Multi-racial	.86	.91	.92	.91	.83	.87	.86	.92	.96	.93

Means and Standard Deviations

Tables III.8a, b, and c present the means and standard deviations for mean item scores on the nine subscales and for the total scale score for each grade level. Scores can range from 1 (Strongly Disagree) to 4 (Strongly Agree).

A 3 (grade level) X 2 (gender) X 3 (position, excluding administrators due to small sample sizes) X race/ethnicity (Caucasian and African-American only due to small sample sizes) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups on the nine subscale scores. Statistically significant overall main effects were found for grade level, F (18, 9194) = 7.54, p < .001, partial η^2 = .015; positions, F (18, 9194) = 6.73, p < .001, partial η^2 = .013; and race/ethnicity, F (18, 9194) = 9.07, p < .001, partial η^2 = .017; but not for gender, F (18, 9194) = 1.28, p = ns. With the exception of grade level X position, F (36, 18396) = 1.12, p < .001, partial η^2 = .004, no interaction effect was statistically significant (p < .01). Because of the very small effect sizes, none of the differences should be interpreted as being of little if any practical value. Thus, follow-up comparisons are not reported.

Table III.8a

Means and standard deviations for DSCS−T/S

		Teacher-Student Relations		Student-Student Relations		Engagement School-wide		Clarity of Expectations		Fairness of Rules		School Safety		Bullying School-wide		Teacher-Home Communications		Staff Relations		Total	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ELEMENTARY																					
Position																					
Teacher	1853	3.52	0.42	3.12	0.45	3.21	0.39	3.40	0.51	3.33	0.51	3.34	0.49	2.09	0.58	3.38	0.46	3.07	0.71	3.25	0.38
Support Staff	511	3.50	0.46	3.17	0.45	3.25	0.39	3.42	0.52	3.36	0.49	3.38	0.51	2.02	0.61	3.32	0.55	3.15	0.69	3.27	0.41
Administrator	100	3.51	0.43	3.39	0.46	3.48	0.42	3.64	0.44	3.56	0.46	3.54	0.48	1.83	.59	3.40	0.50	3.46	0.57	3.46	0.41
Others	347	3.45	0.49	3.15	0.47	3.22	0.41	3.44	0.50	3.33	0.50	3.39	0.50	1.99	0.60	3.36	0.46	3.21	0.63	3.28	0.40
Gender																					
Females	2531	3.50	0.43	3.14	0.45	3.18	0.42	3.42	0.51	3.34	0.51	3.36	0.49	2.06	0.59	3.37	0.48	3.11	0.70	3.26	0.39
Males	279	3.49	0.44	3.11	0.47	3.14	0.41	3.41	0.51	3.34	0.50	3.39	0.50	2.05	0.57	3.35	0.47	3.23	0.69	3.26	0.38
Race/Ethnicity																					
White	2384	3.53	0.42	3.15	0.45	3.18	0.41	3.43	0.51	3.36	0.50	3.37	0.49	2.04	0.59	3.39	0.48	3.13	0.70	3.27	0.39
Black	275	3.25	0.44	3.04	0.45	3.10	0.40	3.34	0.53	3.19	0.52	3.28	0.48	2.14	0.58	3.20	0.45	3.06	0.62	3.14	0.38
Hispanic/ Latino	71	3.41	0.49	3.14	0.41	3.25	0.40	3.44	0.51	3.30	0.51	3.45	0.52	2.05	0.65	3.46	0.52	3.03	0.76	3.26	0.40
Asian	20	3.58	0.43	3.18	0.59	3.37	0.57	3.50	0.53	3.45	0.53	3.52	0.60	2.01	0.64	3.48	0.45	3.18	0.72	3.36	0.48
Mulit-racial	60	3.42	0.44	2.98	0.55	3.05	0.45	3.38	0.53	3.23	0.58	3.24	0.56	2.06	0.59	3.37	0.47	3.03	0.67	3.15	0.36

Table III.8b

Means and standard deviations for DSCS−T/S

		Teacher-Student Relations		Student-Student Relations		Engagement School-wide		Clarity of Expectations		Fairness of Rules		School Safety		Bullying School-wide		Teacher-Home Communications		Staff Relations		Total	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
MIDDLE																					
Position																					
Teacher	892	3.33	0.42	2.80	0.49	2.84	0.44	3.18	0.58	3.17	0.56	2.89	0.64	2.52	0.58	3.22	0.43	2.90	0.74	2.98	0.39
Support Staff	167	3.20	0.50	2.88	0.50	2.98	0.39	3.22	0.52	3.18	0.51	3.01	0.56	2.48	0.57	3.04	0.54	2.99	0.69	3.00	0.40
Administratot	44	3.31	0.46	3.20	0.40	3.22	0.31	3.46	0.44	3.46	0.47	3.36	0.49	2.10	0.59	3.11	0.47	3.35	0.46	3.26	0.34
Others	105	3.29	0.42	2.94	0.41	3.04	0.36	3.30	0.49	3.26	0.49	3.16	0.60	2.36	0.61	3.19	0.47	3.16	0.61	3.10	0.38
Gender																					
Females	905	3.31	0.42	2.83	0.49	2.81	0.46	3.20	0.56	3.18	0.54	2.92	0.61	2.52	0.57	3.18	0.45	2.93	0.73	2.98	0.39
Males	279	3.30	0.44	2.86	0.50	2.82	0.49	3.22	0.60	3.23	0.56	3.02	0.68	2.37	0.62	3.18	0.48	3.00	0.70	3.02	0.42
Race/Ethnicity																					
White	974	3.35	0.42	2.85	0.50	2.82	0.47	3.22	0.57	3.23	0.54	2.96	0.62	2.48	0.58	3.21	0.45	2.97	0.73	3.01	0.40
Black	155	3.06	0.38	2.78	0.47	2.79	0.45	3.16	0.53	2.98	0.52	2.87	0.64	2.51	0.63	3.02	0.43	2.85	0.66	2.89	0.36
Hispanic/ Latino	19	3.28	0.39	2.82	0.50	2.80	0.47	3.37	0.45	3.20	0.64	3.09	0.47	2.58	0.61	3.25	0.48	3.00	0.91	3.01	0.38
Asian	5	3.20	0.20	2.60	0.79	2.47	0.57	3.30	0.41	3.25	0.31	2.60	0.89	2.15	0.34	3.15	0.14	3.10	0.22	2.93	0.25
Mulit-racial	31	3.15	0.43	2.81	0.42	2.79	0.37	2.84	0.72	2.98	0.60	2.80	0.76	2.53	0.55	3.04	0.60	2.89	0.69	2.87	0.36

Table III.8c

Means and standard deviations for DSCS−T/S

		Teacher-Student Relations		Student-Student Relations		Engagement School-wide		Clarity of Expectations		Fairness of Rules		School Safety		Bullying School-wide		Teacher-Home Communications		Staff Relations		Total	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
HIGH																					
Position																					
Teacher	819	3.29	0.41	2.84	0.44	2.69	0.48	3.06	0.59	3.07	0.52	2.96	0.59	2.36	0.55	3.11	0.44	2.79	0.75	2.93	0.37
Support Staff	132	3.15	0.39	2.87	0.49	2.89	0.43	3.11	0.56	3.10	0.53	2.97	0.53	2.40	0.56	2.93	0.45	2.91	0.70	2.95	0.36
Administrator	41	3.25	0.46	3.15	0.34	3.12	0.44	3.33	0.47	3.27	0.39	3.33	0.47	1.99	0.52	3.06	0.44	3.16	0.50	3.18	0.31
Others	100	3.23	0.44	2.89	0.43	2.95	0.41	3.19	0.56	3.14	0.50	3.07	0.54	2.29	0.59	3.12	0.39	3.01	0.56	3.03	0.35
Gender																					
Females	693	3.24	0.41	2.82	0.44	2.66	0.51	3.05	0.56	3.05	0.50	2.90	0.57	2.41	0.54	3.05	0.42	2.80	0.71	2.90	0.36
Males	399	3.32	0.42	2.90	0.45	2.73	0.51	3.15	0.60	3.15	0.53	3.12	0.56	2.24	0.58	3.15	0.48	2.91	0.74	3.01	0.39
Race/Ethnicity																					
White	920	3.29	0.40	2.86	0.45	2.68	0.51	3.09	0.59	3.09	0.53	2.98	0.58	2.36	0.57	3.10	0.43	2.84	0.71	2.94	0.37
Black	109	3.05	0.39	2.89	0.40	2.80	0.45	3.15	0.43	3.03	0.38	3.03	0.52	2.22	0.53	3.01	0.44	2.95	0.60	2.96	0.31
Hispanic/ Latino	24	3.13	0.54	2.69	0.50	2.49	0.54	2.94	0.59	2.97	0.61	3.00	0.67	2.47	0.47	2.92	0.51	2.54	0.99	2.78	0.47
Asian	10	3.50	0.46	3.10	0.46	2.90	0.50	3.30	0.39	3.18	0.36	3.27	0.41	1.80	0.37	3.30	0.50	3.23	0.48	3.24	0.34
Mulit-racial	29	3.30	0.45	2.70	0.52	2.43	0.60	2.85	0.76	3.08	0.52	2.85	0.75	2.39	0.51	2.99	0.61	2.35	0.90	2.77	0.43

Concurrent Validity

At the school-wide level, using aggregated scores across all respondents within each school, we examined correlations between DSCS−T/S scores, suspension and expulsion rates, and academic achievement. Data for suspensions/expulsions and academic achievement were taken from each school's "school profiles" website, which is maintained by the Delaware Department of Education. Data are for the 2012-2013 school year. Suspension/expulsion data consist of the percentage of students (non-duplicated count) suspended or expelled that school year. Academic achievement scores consist of the percentage of students passing the state's examination of the standards of learning in English/Language Arts and Mathematics.

Table III.9 shows correlations of DSCS-T/S scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level. Across all three grade levels, the total scale score correlated from .503 to .722 with school-level indices of academic achievement and from -.263 to -.669 with school-level suspensions and expulsions.

Table III.9

Correlations between DSCS−T/S Scores and Academic Achievement and Suspensions/Expulsions

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Teacher–Student Relations	.522**	.648**	-.574**	.577**	.590**	-.463**	.353	.431*	-.661**
Student–Student Relations	.716**	.746**	-.753**	.683**	.635**	-.586**	.629**	.704**	-.668**
Schoolwide Engagement	.743**	.816**	-.734**	.727**	.746**	-.683**	.731**	.775**	-.774**
Clarity of Expectations	.498**	.624**	-.541**	.444*	.396*	-.246	.420*	.397*	-.424*
Fairness of Rules	.559**	.611**	-.566**	.506**	.468**	-.400*	.559**	.461*	-.419*
School Safety	.591**	.683**	-.696**	.590**	.543**	-.486**	.574**	.590**	-.580**
Bullying Schoolwide	-.687**	-.700**	.690**	-.660**	-.612**	.463*	-.534**	-.547**	.500*
Teacher-Home Communications	.604**	.698**	-.555**	.551**	.614**	-.530**	.330	.547**	-.700**
Staff Relations	.307**	.270**	-.211*	.214	.259	-.198	.230	.222	-.360
Total School Climate	.655**	.622**	-.527**	.617**	.603**	-.508**	.587**	.613**	-.676*

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n = 75 schools, [b] n = 27 schools, [c] 20 schools.
*p < .05. **p < .01. One tailed.

Positive, Punitive, and SEL Techniques Scale−Teacher/Staff (DTS-T/S)

Confirmatory Factor Analyses

The same methods used above for the DSCS−T/S were used in the analyses. This included group mean centering, thereby producing ICCs of zero for each item. This was done given that the ICCs on the factor scores in the full sample ranged from .23 (Punitive Techniques) to .28 (Positive Techniques).

Based on preliminary exploratory and confirmatory factor analyses (CFA), two items were deleted because they correlated very highly with one another and item and/or had high dual loadings: # 16. *Teachers use just enough punishment; not too much or too.* and # 18. *All students receive rewards for doing a good job.*

A proposed three-factor model was first tested, and compared to two alternative models: a one-factor model and a second-order model with one higher-order factor and three lower-order factors.

Results of Confirmatory Factor Analyses

Comparing three-factor model with alternative models. As shown in Table III.10, the proposed three-factor model yielded adequate fit indices, whereas the one-factor model yielded poor fit statistics. A second-order model with one higher order factor and three lower factors also was estimated. Each of the fit indices for this model was the same as the 3-factor model because the model was just identified. As scores for the positive, punitive and social-emotional technique subscales are reported separately and not combined; the three-factor model was selected as the final model.

Table III.10

Fit Statistics for Models Tested (DTS-T/S)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	2,822.38*	104	.720	.095	.102
Three-factor model	854.26*	101	.923	.045	.054
Second-order model	854.26*	101	.923	.045	.054

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =2,513. Models were tested on approximately one half of sample, randomly selected.
*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the 3-factor model: χ^2 = 860.38 (101, *N* =2,513), $p < .001$; CFI = .923, RMSEA = .055, and SRMR = .049. The completely standardized factor loadings were also compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table III.11, the indicators

had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table III.12.

Table III.11

Confirmatory Factor Analysis of the Technique Scale -Staff: Three-factor Model (DTS-T/S)

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Positive						
2. Students are praised often.	0.71	0.02	43.62	0.73	0.02	48.40
5. Students are often given rewards for being good.	0.64	0.02	35.35	0.67	0.02	36.12
8. Teachers often let students know when they are being good.	0.75	0.02	50.28	0.79	0.01	68.36
11. Classes get rewards for good behavior.	0.61	0.02	28.65	0.64	0.02	33.90
14. Teachers use just enough praise and rewards; not too much or too little.	0.52	0.02	24.30	0.50	0.02	20.73
Punitive						
1. Students are punished a lot.	0.55	0.02	22.62	0.57	0.02	24.94
4. Students are often sent out of class for breaking rules.	0.60	0.03	24.41	0.61	0.03	24.23
7. Students are often yelled at by adults.	0.62	0.02	27.65	0.61	0.03	21.55
10. Many students are sent to the office for breaking rules.	0.66	0.03	23.34	0.66	0.03	25.97
13. Students are punished too much for minor things.	0.61	0.02	27.87	0.58	0.03	19.46
SEL						
3. Students are taught to feel responsible for how they act.	0.71	0.02	41.00	0.71	0.01	53.62
6. Students are taught to understand how others think and feel.	0.83	0.01	80.17	0.83	0.01	77.69
9. Students are taught that they can control their own behavior.	0.75	0.02	46.02	0.76	0.01	57.73
12. Students are taught how to	0.76	0.01	71.98	0.78	0.01	65.42

solve conflicts with others.						
15. Students are taught they should care about how others feel.	0.84	0.01	87.74	0.84	0.01	71.97
17. Students are often asked to help decide what is best for the class or school.	0.49	0.02	26.30	0.50	0.02	25.50
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table III.12

Fit Statistics Between Groups for Three-factor Model (*DTS=T/S*)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	5,028	1,622.37*	101	.916	.047	.055
Elementary	2,781	970.21*	101	.927	.043	.056
Middle	1,167	452.01*	101	.913	.060	.055
High	1,080	567.81*	101	.876	.064	.065
Male	948	438.06*	101	.899	.059	.059
Female	4,080	1,328.08*	101	.920	.046	.055
White	4,237	1481.07*	101	.914	.048	.057
Black	526	205.87*	101	.922	.052	.044
Hispanic	113	171.80*	101	.773	.109	.079
Other race/ethnicity	117	212.15*	101	.603	.132	.097
Teacher	3,502	1,227.40*	101	.909	.050	.056
Administrator	183	137.06*	101	.909	.072	.044
Support staff	798	284.87*	101	.941	.047	.048
Other positions	545	176.57*	101	.957	.041	.037

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *p <.001

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table II.15). The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated that there was weak factorial invariance across grade level: Satorra–Bentler scaled chi-square difference test = 99.93 (Δdf = 26), $p < .001$, ΔCFI = -.001, ΔRMSEA = -.003, ΔSRMR = .002. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, strong invariance was found across grade level: Satorra–Bentler scaled chi-square difference test = 164.22 (Δdf = 28), $p < .001$, ΔCFI = -.007, ΔRMSEA = .000, and ΔSRMR = .00.

Measurement invariance across gender. The test statistics for configural invariance (Model 1) across gender indicated adequate model fit (see Table II.15). The weak factorial invariance

model (Model 2) was nested within Model 1. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated that there was weak factorial invariance across grade level: Satorra–Bentler scaled chi-square difference test = 24.85 (Δdf = 13), $p < .05$, ΔCFI = .000, ΔRMSEA = -.002, ΔSRMR = .001. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, strong invariance was found across grade level: Satorra–Bentler scaled chi-square difference test = 108.31 (Δdf = 13), $p < .001$, ΔCFI = -.005, ΔRMSEA = .000, and ΔSRMR = .00.

Measurement invariance across positions. A model testing the configural invariance of the confirmatory factor analysis across three different position groups (i.e., Teachers, Administrators, Support Staff, and Others) yielded fit statistics suggesting adequate model fit (see Table II.15). Reports from administrators were excluded from the invariance test due to small sample size and poor model fit. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated that there was weak factorial invariance across race-ethnicity: Satorra–Bentler scaled chi-square difference test = 51.09 (Δdf = 35), $p < .05$, ΔCFI = .001, ΔRMSEA = -.002, and ΔSRMR = .001. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance in the starting point of origin for the subscale was found across race: Satorra–Bentler scaled chi-square difference test = 147.90 (Δdf = 39), $p < .001$, ΔCFI = -.007 ΔRMSEA = .000, and ΔSRMR = .00.

Measurement invariance across race/ethnicity. A model testing the configural invariance across two different race/ethnicity groups (i.e., White and Black) yielded fit statistics suggesting adequate model fit (see Table II.5). Reports from subgroups with Hispanic, Asian and Other race/ethnicity backgrounds were excluded from the race/ethnicity group measurement invariance analyses due to small sample size and poor model fit of these subgroups. The difference between test statistics for the weak factorial (Model 2) and configural (Model 1) invariance models indicated weak factorial invariance across race-ethnicity: Satorra–Bentler scaled chi-square difference test = 24.19 (Δdf = 13), $p = ns$, ΔCFI = .001, ΔRMSEA = .002, and ΔSRMR = -.002. When the test statistics for the strong factorial (Model 3) and weak factorial (Model 2) invariance were compared, invariance was found across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 96.65 (Δdf = 13), $p < .001$, ΔCFI = -.005, ΔRMSEA = .000, and ΔSRMR = .000.

Table III.13

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Grade Level, Gender, Position, and Race/Ethnicity (DTS –T/S)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	2,045.33*	303	.915	.052	.059
Model 2	2,081.05*	329	.914	.054	.056
Model 3	2,245.51*	355	.907	.054	.056
Gender group					
Model 1	1,78.89*	202	.917	.048	.056
Model 2	1,79.47*	215	.917	.049	.054
Model 3	1,898.73*	228	.912	.049	.054
Position Group (Teachers, Support Staff, and Other Position subgroups)					
Model 1	1,616.19*	404	.920	.05	.049
Model 2	1,655.00*	443	.921	.051	.047
Model 3	1,800.70*	482	.914	.051	.047
Race/Ethnicity Group (White and Black subgroups)					
Model 1	1,603.38*	202	.915	.048	.054
Model 2	1,608.62*	215	.916	.050	.052
Model 3	1,705.88*	228	.911	.050	.052

Note. Model 1: Configural invariance. Model 2: Weak factorial invariance. Model 3: Strong factorial invariance. χ2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Correlations among Factors

For all teachers/staff combined, use of positive techniques correlated -.44 with punitive techniques and .69 with SEL techniques. Punitive techniques correlated -.40 with SEL techniques.

Reliability

With respect to the reliability of DSCS−T/S scores (see Table III.14) for all respondents combined across grade levels, internal consistency coefficients ranged from .71 to .92. There were negligible differences between the alpha coefficients for elementary school (range .79 to .91), middle school (range .78 to .88), high school (range .65 to .88); between teacher group (range .76 to .92), support staff group (range .80 to .92), administrator group (.83 to .92), and other position groups (range .78 to .90). Across all subgroups, the lowest alpha coefficients were for Punitive Techniques and the highest for SEL Techniques.

Table III.14			
Reliability Coefficients (DTS-T/S)			
	Positive Behavior Techniques	Punitive Techniques	SEL Techniques
Full Sample	.83	.79	.90
Grade Level			
Elementary	.80	.81	.89
Middle	.80	.73	.88
High	.75	.70	.87
Position			
Teacher	.82	.76	.90
Administrator	.84	.84	.91
Support Staff	.86	.82	.90
Other	.83	.84	.88
Gender			
Female	.83	.79	.90
Male	.80	.75	.89
Race/Ethnicity			
White	.83	.78	.90
Black	.80	.77	.86
Hispanic/Latino	.82	.79	.91
Asian	.83	.77	.87
Multi-racial	.81	.75	.91

Means and Standard Deviations

Tables III.15a, b. and c present the means and standard deviations for mean item scores on the three subscales for each grade level. Scores can range from 1 (Strong Disagree) to 4 (Strongly Agree).

A 3 (grade level) X 2 (gender) X 3 (position, excluding administrators due to small sample sizes) X race/ethnicity (Caucasian and African-American only due to small sample sizes) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups on the three subscale scores. Statistically significant overall main effects were found for grade level, F (6, 9102) = 30.71, p < .001, partial η^2 = .02; positions, F (6, 9102) = 8.60, p < .001, partial η^2 = .006; and race/ethnicity, F (3, 4550) = 9.48, p < .001, partial η^2 = .006; but not for gender, F (3, 4550) = 2.35, p = ns. No interaction effect was statistically significant (p < .01). With the exception of the grade level effect, all other effects yielded very small effect sizes, and thus should be interpreted as being of little if any practical value. Thus, follow-up comparisons are not reported for those variables.

Grade level differences were statistically significant for use of positive behavioral, punitive, and SEL techniques, with Bonferroni follow-up tests revealing that teachers/staff in elementary schools reported greater use of positive and SEL techniques and less use of punitive techniques compared to middle school and high schools; middle school teachers/staff reported greater use of positive behavioral and SEL techniques compared to high school teachers/staff. There were no differences between middle and high schools in use of punitive techniques.

Table III.15a

Mean and Standard Deviations (DTS-T/S)

		Positive Behavior Techniques		Punitive Techniques		SEL Techniques	
	N	Mean	SD	Mean	SD	Mean	SD
Elementary							
Position							
Teacher	1833	3.28	0.41	1.80	0.44	3.18	0.45
Support Staff	507	3.27	0.45	1.87	0.51	3.20	0.50
Administrators	99	3.36	0.41	1.66	0.51	3.36	0.43
Other	343	3.26	0.41	1.85	0.48	3.22	0.44
Gender							
Female	2506	3.28	0.42	3.19	0.46	3.16	0.47
Male	275	3.25	0.42	3.15	0.49	3.16	0.47
Race/Ethnicity							
White	2360	3.29	0.42	3.21	0.46	3.17	0.47
Black	272	3.20	0.37	3.04	0.49	3.11	0.43
Hispanic/Latino	71	3.27	0.41	3.03	0.52	3.13	0.48
Asian	20	3.34	0.59	3.12	0.49	3.11	0.52
Multi-racial	58	3.23	0.41	3.11	0.42	3.13	0.48

Table III.15b							
Mean and Standard Deviations (DTS-T/S)							
		Positive Behavior Techniques		Punitive Techniques		SEL Techniques	
	N	Mean	SD	Mean	SD	Mean	SD
Middle							
Position							
Teacher	880	2.99	0.42	2.03	0.40	2.80	0.51
Support Staff	163	2.97	0.42	2.15	0.49	2.90	0.42
Administrators	43	3.02	0.34	2.02	0.54	3.07	0.37
Other	104	3.09	0.44	2.04	0.51	3.01	0.51
Gender							
Female	890	2.99	0.41	2.95	0.42	2.78	0.51
Male	277	3.00	0.42	2.97	0.47	2.84	0.51
Race/Ethnicity							
White	965	3.02	0.41	2.98	0.41	2.80	0.52
Black	149	2.90	0.42	2.78	0.48	2.82	0.43
Hispanic/Latino	18	2.93	0.39	2.92	0.39	2.85	0.41
Asian	5	3.16	0.33	3.24	0.48	2.67	0.75
Multi-racial	30	2.89	0.47	2.89	0.49	2.60	0.61

Table III.15c							
Mean and Standard Deviations (DTS-T/S)							
		Positive Behavior Techniques		Punitive Techniques		SEL Techniques	
	N	Mean	SD	Mean	SD	Mean	SD
High							
Position							
Teacher	812	2.75	0.40	2.03	0.40	2.69	0.51
Support Staff	128	2.70	0.46	2.18	0.46	2.79	0.47
Administrators	41	2.79	0.41	2.03	0.37	2.93	0.46
Other	99	2.86	0.38	2.14	0.40	2.93	0.34
Gender							
Female	684	2.73	0.41	2.94	0.41	2.66	0.50
Male	396	2.80	0.40	2.95	0.41	2.74	0.51
Race/Ethnicity							
White	912	2.76	0.41	2.95	0.41	2.69	0.51
Black	105	2.75	0.37	2.90	0.36	2.74	0.40
Hispanic/Latino	24	2.74	0.43	2.87	0.40	2.71	0.56
Asian	10	2.94	0.45	3.04	0.41	2.93	0.39
Multi-racial	29	2.72	0.48	2.90	0.48	2.59	0.64

Concurrent Validity

Table III.16 shows correlations of DSCS-T/S scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level. Consistent with results of the student surveys, punitive and SEL techniques correlated with suspensions as predicted (with the exception of SEL in middle school). However, positive techniques did not correlate significantly with either achievement or suspensions/expulsions in middle school, and only with suspensions/expulsions in high school.

Table III.16

Correlations between Techniques and Academic Achievement and Suspensions/Expulsions (DTS-T/S)

	Elementary Schools[a]			Middle Schools[b]			High Schools[c]		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Positive Techniques	.319**	.347**	-.244*	.258	.278	-.234	.137	.261	-.542**
Punitive Techniques	.692**	.688**	-.672**	.655**	.649**	-.674**	.396*	.483*	-.627**
SEL Techniques	.544**	.540**	-.415**	.390*	.386*	-.288	.607**	.529**	-.619**

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n = 75 schools, [b] n = 27 schools, [c] 20 schools.
*p < .05. **p < .01. One tailed.

CHAPTER 4
VALIDITY AND RELIABILITY OF SCALES OF THE DELAWARE SCHOOL SURVEY—HOME: ENGLISH VERSION

The Home version of the Delaware School Survey consists of three separate scales: *Delaware School Climate Scale−Home (DSCS−H),* the *Delaware Bullying Victimization Scale−Home (DBVS−H)*, and the *Delaware Student Engagement Scale−Home (DSES−H)*. In this chapter we present evidence of the validity and reliability of scores on each of those scales based on analyses of 2015 data. Evidence is presented for the English version in this chapter, and the Spanish version of the DSCS-H (Spanish DSCS-H) in Chapter 5. With the exception of the language used, items on the DSCS-H (English) are the same as those on the Spanish DSCS-H.

For all results reported in this chapter, the same statistical procedures used in analyzing the student and teacher/staff versions of the survey, as detailed in Chapter 2, were followed.

Delaware School Climate Scale –Home (DSCS−H)

The DSCS-H consists of 29 items supported by CFA results. As described in Chapter 1, six aspects of school climate are assessed by 21 items that are shared by the student, teacher/staff, and home versions of the surveys: Teacher–Student Relations (5 items), Student–Student Relations (5 items), Clarity of Expectations (4 items), Fairness of Rules (4 items), and School Safety (3 items). Four additional items on the Home version assess Teacher-Home Communications. Research and theory supporting the ten factors of the DSCS-H were presented in Chapter 1.

Four items also included on the survey assess Satisfaction with School. Those items are viewed as constituting a separate scale, and thus are not including in calculating the Total School Climate Score.

The development of the *DSCS−H* and evidence of validity and reliability of its scores are presented in a research article by Bear, Yang, and Pasipanodya entitled "Assessing School Climate: Validation of a Brief Measure of the Perceptions of Parents" published in *Journal of Psychoeducational Assessment* (Volume *32,* 2014). That study was conducted on the 2013 version of the survey, with the CFA conducted on 16,173 parents/guardians of students in 99 public schools. Results showed that a bifactor model consisting of one general factor and seven specific factors best represented the data. Those factors were Teacher–Student Relations, Student–Student Relations, Teacher–Home Communication, Respect for Diversity, School Safety, Fairness of Rules, and Clarity of Expectations. Configural, weak factorial, and strong factorial invariance were found across three grade level groups, five racial-ethnic groups, and gender. Evidence of criterion-related validity was found in scores across all factors correlating significantly at the elementary and middle school levels with academic achievement, bullying victimization, and school suspensions/expulsions.

It should be noted that although 2013 data were used in analyses reported in journal article and reported in this chapter, the results differ. For example, the CFA results presented in this chapter

show that a second-order factor model, as opposed to a bifactor model, best represent the scale (although both models yield adequate fit indices).

The purpose of this chapter is to present results of CFA conducted on the 2015 DSCS-H, as well as additional evidence of validity and reliability of its scores.

Participants

The 2015 sample consisted of a total of 16,778 parents/guardians of students in 103 schools in Delaware, representing 65% of public general education elementary, middle, and high schools. Descriptive information about the sample is presented in Table IV.1.

The 103 schools in the study volunteered to participate upon an invitation from the Delaware DOE. Schools were given the option of a paper Scantron (English or Spanish version) or online survey format (English or Spanish version). Schools electing to use the paper Scantron format were sent enough surveys to send home to the parent/guardian of every child enrolled. 92.8% of participants completed the English Scantron and 6.7% of participants completed the Spanish Scantron version. The online format was completed only by only .3% of participants.

The DSCS-H surveys were distributed to parents in January or February 2015. In addition to completing the items for measuring school climate, parents were asked to identify their child's race ("American Indian or Alaskan Native," "Asian," "Black," "Hawaiian," "Hispanic/Latino," "Multi-Racial," and "White"), gender, and grade. They also responded to an item that identified their relation to the child (e.g., mother or stepmother, grandfather, aunt, etc.). Finally, they were asked to respond to a series of items that assessed the language spoken by the child and at home (i.e., field testing of new items to allow for examining scores of English Language Learners).

Table IV.1

Demographic Information of the Sample (*DSCS−H*)

Grade Level				
	Elementary (73 schools)	Middle (22 schools)	High (8 schools)	Full Sample (103 schools)
Gender of Student				
Male	5,687	1,511	486	7,684
Female	6,543	1,902	649	9,094
Race of Student				
White	5,572	1,587	687	7,846
Black	2,825	804	250	3,879
Hispanic/ Latino	2,101	564	77	2,742
Asian	744	187	55	986
Multi-Racial	988	271	66	1,325
Total	12,230	3413	1135	16,778

Confirmatory Factor Analyses

In conducting CFA for the DSCS-H, the same statistical procedures used in analyzing the student and teacher/staff versions of the survey, including for the CFA as detailed in Chapter 2, were followed. This included group mean centering, thereby producing ICCs of zero for each item. This was done given that the ICCs on the factor scores in the full sample ranged from .07 (Clarity of School Rules) to .16 (Safety), and the ICC of total school climate score was .14.

Consistent with procedures used for the Student and Teacher/Staff measures, and based on preliminary exploratory and confirmatory factor analyses, three items on the Respect for Diversity Factor were deleted from further analyses due to poor factor loadings. The three items deleted were:

#12. Adults care about students of all races.
 # 26. Students of different races get along.
#27. Teachers expect the best from students of all races.

Two additional items on that original factor were moved to another factor. The item "*Teachers treat students of all races with respect*" was moved to Teacher-Student Relationships and "*Students respect others who are different"* was moved to Student-Student Relationships. As a result of these preliminary analyses, the model consisted of six factors (removing the previous Respect for Diversity factor). The six-factor model was compared with three alternative models: a one-factor model, a second-order model with one high order factor and six lower order factors, and a bifactor model with a general factor and six specific factors.

Results of Confirmatory Factor Analyses

Comparing seven-factor model with alternative models. As shown in Table IV.2, the hypothesized second-order model yielded adequate fit indices, whereas a one-factor model (the most parsimonious of the three alternative models) yielded poor fit statistics. A six-factor correlation model and a bifactor model also achieved adequate model fit, with the six-factor model yielding the best fit among the models tests. However, considering the second-order model is more consistent with the theoretical framework of school climate construct, and the fit indices were adequate, it was chosen as the final model.

Table IV.2

Fit Statistics for Models Tested (DSCS-H)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	17,245.21*	275	.761	.069	.086
Six-factor correlation model	4,347.12*	260	.942	.030	.043
Second-order model	5,574.04*	269	.925	.043	.048
Bifactor model	4,573.81*	250	.939	.036	.045

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean-Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s = 8,389. Models were tested on approximately one half of sample, randomly selected. *$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly selected half of the sample also generated robust fit statistics for the second-order model: χ^2 = 5,540 (269, *N* = 8,389), *p* < .001; CFI = .926, RMSEA = .048, and SRMR = .042. Completely standardized factor loadings were also compared to ensure that there were no large differences between the randomly split samples. As illustrated in Table IV.3, indicators demonstrated similar factor loadings on the six factors in both halves of the sample. As no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the six-factor model with full sample and subsamples is presented in Table IV.4. The subgroup of parents of high schools achieved poor model fit, thus it was excluded from the following measurement invariance test.

Table IV.3

Confirmatory Factor Analysis of Second-order Model (DSCS-H)

	Sample 1			Sample 2		
Factor and Items	Loading	*SE*	*z*	Loading	*SE*	*z*
Second-order Factor: School Climate						
Factor 1: Teacher-Student Relations	.96	.00	224.01	.96	.00	225.53
Factor 2: Student-Student Relations	.73	.01	75.23	.75	.01	75.93
Factor 3: Clarity of Expectations	.90	.01	115.20	.89	.01	111.00
Factor 4: Fairness of Rules	.95	.01	143.20	.95	.01	165.06
Factor 5: Safety	.88	.01	91.06	.88	.01	91.58
Factor 6:Teacher-Home Communication	.88	.01	123.61	.88	.01	119.57
Factor 1: Teacher-Student Relations						
2. Teachers treat students of all races with respect.	.76	.01	101.58	.77	.01	94.53
7. Teachers care about their students.	.81	.01	152.40	.81	.01	133.92
17. Teachers listen to students when they have problems.	.80	.01	132.19	.80	.01	13.87
22. Adults who work here care about the students.	.82	.01	136.15	.83	.01	152.81
32. Teachers like their students.	.82	.01	125.12	.83	.01	121.48
Factor 2: Student-Student Relations						
11. Students are friendly with each other.	.80	.01	106.84	.79	.01	103.73
16. Students care about each other.	.83	.01	126.23	.84	.01	122.28
21. Students respect others who are different	.78	.01	95.79	.79	.01	121.47
30. Students treat each other with	.89	.01	159.75	.90	.01	188.40

respect.						
31. Students get along with each other.	.89	.01	139.33	.90	.01	172.03
Factor 3: Clarity of Expectations						
5. Rules are made clear to students.	.82	.01	10.40	.80	.01	82.26
10. Students know how they are expected to act.	.85	.01	127.06	.84	.01	103.47
15. Students know what the rules are.	.87	.01	146.79	.88	.01	137.42
20. It is clear how students are expected to act.	.88	.01	141.95	.89	.01	149.95
Factor 4: Fairness of Rules						
3. The school rules are fair.	.80	.01	118.30	.81	.01	12.33
8. The consequences of breaking rules are fair.	.77	.01	74.66	.77	.01	74.32
18. The school's Code of Conduct is fair.	.84	.01	111.89	.84	.01	112.15
28. Classroom rules are fair.	.84	.01	106.25	.85	.01	121.36
Factor 5: Safety						
4. Students are safe in the hallways.	.76	.01	79.61	.75	.01	75.59
13. Students feel safe.	.90	.01	16.92	.89	.01	167.08
19. Students know they are safe.	.90	.01	181.10	.91	.00	211.60
Factor 6:Teacher-Home Communication						
1. Teachers listen to the concerns of parents.	.76	.01	106.72	.76	.01	84.50
23. Teachers show respect toward parents.	.83	.01	116.31	.84	.01	104.05
24. Teachers work closely with parents to help students when they have problems.	.86	.01	125.87	.86	.01	122.55
25. Teachers do a good job communicating with parents.	.83	.01	128.94	.83	.01	121.32
Note. Loading = standardized factor loading; *SE* = standard error; *z* = robust *z* score.						

Table IV.4

Fit Statistics Between Groups for Second-order Model (DSCS-H)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	16,778	10,065.23*	269	.922	.042	.047
Elementary	12,230	8,303.56*	269	.928	.039	.049
Middle	3,413	2,270.30*	269	.930	.052	.047
High	1,135	1,088.72*	269	.896	.059	.052
Boys	7,684	5,422.65*	269	.924	.043	.050
Girls	9,094	5,420.16*	269	.932	.041	.046
White	7,846	5,772.83*	269	.924	.044	.051
African American	3,879	2,436.01*	269	.928	.043	.046
Hispanic	2,742	1,673.65*	269	.938	.039	.044
Asian	986	903.63*	269	.939	.038	.049
Other	1,325	1,102.28*	269	.932	.051	.048

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across grade level. A model testing the configural invariance across elementary and middle yielded fit statistics that suggested adequate model fit (see Table IV.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 60.07 (Δdf = 19), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 36.33 (Δdf = 5), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across grade level: Satorra–Bentler scaled chi-square difference test = 80.03 (Δdf = 19), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 832.95 (Δdf = 5), p < .001, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female parents yielded fit statistics that suggested adequate model fit (see Table IV.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order

factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 14.57 (Δdf = 19), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 16.11 (Δdf = 5), p < .05, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 18.30 (Δdf = 19), p = *ns*, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 20.84 (Δdf = 5), p < .001, ΔCFI < .01.

Measurement invariance across race. A model testing the configural invariance across White, African-American and Hispanic parents yielded fit statistics that suggested adequate model fit (see Table IV.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 153.68 (Δdf = 76), p <.001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 72.23 (Δdf =20), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race: Satorra–Bentler scaled chi-square difference test = 76.66 (Δdf = 76), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race: Satorra–Bentler scaled chi-square difference test = 35.49 (Δdf = 23), p = ns, ΔCFI < .01.

Table IV.5

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Grade Levels, Gender, and Race/Ethnicity (DSCS-H)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade Level (Elementary and Middle Schools)					
Model 1	11,210.67*	538	.929	.042	.050
Model 2	11,361.09*	557	.928	.042	.050
Model 3	11,402.00*	562	.927	.043	.050
Model 4	11,785.31*	581	.925	.043	.050
Model 5	11,886.37*	586	.924	.043	.050
Gender					
Model 1	10,842.84*	538	.928	.042	.048
Model 2	10,996.03*	557	.926	.042	.047
Model 3	11,040.16*	562	.927	.042	.047
Model 4	1,1410.32*	581	.924	.042	.047
Model 5	11,508.09*	586	.923	.042	.047
Race/Ethnicity (all five groups)					
Model 1	11,971.92*	1,345	.931	.043	.049
Model 2	12,293.60*	1421	.929	.044	.048
Model 3	12,397.97*	1,441	.929	.045	.048
Model 4	13,045.99*	1,517	.925	.045	.048
Model 5	13,243.03*	1540	.924	.045	.048

*$p < .001$.

Correlations among Factors

Correlations among scores on each of the subscales were computed to examine the relative independence of the scores, as well as the extent to which each assessed the construct of school climate. For these analyses, and all other analyses that follow, we used manifest indicators of the factor (i.e., sum of raw scores of items on the derived subscales and total scale). As shown in Table IV.6, for all parents combined, correlation coefficients among subscales ranged in strength of value (i.e., absolute value) from .62 to .85).

Table IV.6

Correlational Coefficients between Subscale and Total Scale Scores for the Full Sample (*DSCS−H*)

	1	2	3	4	5	6
1. Teacher–Student Relations						
2. Student–Student Relations	.70					
3. Clarity of Expectations	.78	.62				
4. Fairness of Rules	.81	.65	.83			
5. School Safety	.78	.75	.77	.77		
6. Teacher Home Communication	.85	.62	.71	.75	.69	
7. Total School Climate	.93	.84	.88	.90	.89	.87

Note. All correlations are significant at $p < .001$.

Reliability

With respect to the reliability of DSCS−H scores, for all parents combined across grade levels, internal consistency coefficients across the seven subscales ranged from .90 to .97. The reliability of scores for each of the seven subscales also was computed for each of the five racial–ethnic groups, gender, and three grade levels. As shown in Table IV.7, reliability coefficients ranged from .88 (Fairness for Black parents and Safety for Hispanic/Latino Parents) to .94 (Student-student relations for parents of Multi-Racial and White students and Clarity for parents of White students), with a median correlation coefficient of .91. There were negligible differences between the alpha coefficients for elementary school (range .90 to .93, median = .91), middle school (range .87 to .93, median = .89), and high school (range .86 to .92, median = .90) parents; between White (range .91 to .94, median = .92), Black (range .88 to .93, median = .90), Hispanic (range 87 to .92, median = .89) parents and Asian (range .89 to .93, median =.90); and between males (range .90 to .93, median = .91) and females (range .90 to .94, median = .91). As expected given the larger number of items, reliability was highest for the total DSCS-H score: Across grade level, racial-ethnic, and gender groups alphas ranged from .96 to .98, with an overall alpha of .97 for all parents combined).

Table IV.7

Coefficients of Internal Consistency by Grade Level and Race/Ethnicity (*DSCS−H*)

	Teacher Student Relations	Student-Student Relations	Clarity	Fairness	Safety	Teacher-Home Communication	Total School Climate	Parent Satisfaction *
Full Sample	.91	.93	.92	.90	.91	.90	.97	.86
Grade Level								
Elementary	.91	.93	.93	.90	.90	.90	.97	.85
Middle	.90	.93	.89	.87	.89	.87	.96	.85
High	.89	.92	.91	.89	.90	.86	.97	.87
Gender								
Male	.91	.93	.93	.91	.91	.90	.97	.87
Female	.91	.94	.92	.90	.90	.90	.97	.86
Race/ Ethnicity								
White	.92	.94	.94	.92	.92	.91	.98	.88
Black	.91	.93	.90	.88	.89	.89	.97	.85
Hispanic/ Latino	.89	.92	.89	.87	.88	.89	.97	.85
Asian	.91	.93	.91	.89	.89	.89	.97	.86
Multi-Racial	.92	.94	.93	.91	.92	.91	.97	.86

Note. *Is not calculated into Total Score, as this is viewed as a separate scale.

Means and Standard Deviations

Table IV.8 presents the means and standard deviations for raw scores on the six subscales of the DSCS-H, and for the total scale score as a function of grade level, gender, and race/ethnicity. Means and standard deviations also are presented for the Satisfaction Scale. Table IV.9 presents means and standard deviations for grades 1-12.

A 3 (grade level) X 2 (gender) X 4 (race/ethnicity) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in the six subscale scores.

Statistically significant overall main effects were found for grade level, F (12, 26534) = 73.98, p < .001, partial η^2 = .032; gender, F (6, 13266) = 7.69, p < .001, partial = .003; and race/ethnicity, F (24, 53076) = 7.98, p < .001, partial η^2 = .004.

All interaction effects also were statistically significant: grade level X gender, F (48, 26534) = 3.11, p < .001, partial η^2 = .001; grade level X race/ethnicity, F (48, 79626) = 1.86, p < .001, partial η^2 = .001; gender X race/ethnicity, F (24, 53076) = 2.25, p < .001, partial η^2 = .001; and grade level X gender X race/ethnicity, F (48, 79626) = 2.16, p < .001, partial η^2 = .001. Because of the very small effect sizes, with the exception of the main effect for grade level, the differences should be interpreted as being of little if any practical value. Thus, follow-up comparisons are only reported for the grade level main effect.

Significant grade level differences were found on each of the subscales (p < .001), with partial eta squares ranging from .017 (Clarity of Expectations) to .051 (Safety). Bonferroni follow-up tests showed that elementary students scored higher than middle school and high school students on each of the six subscales. Differences between middle and high school students were less consistent. Middle school students scored slightly, yet significantly, higher than high school students on Teacher-Student Relationships, Fairness of Rules, and Teacher Home Communication. No significant differences were found for Student-Student Relationships, Clarity of Expectations, and Safety.

Table IV.8

Means and Standard Deviations as a Function of Grade Level, Gender, and Race/Ethnicity (*DSCS–H*)

		Teacher-Student Relations		Student-Student Relations		Clarity of Expectations		Fairness of Rules		School Safety		Teacher-Home Communication		Total School Climate		Parent Satisfaction*	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Elementary																	
Gender																	
Male	5467	3.41	0.47	3.17	0.53	3.43	0.49	3.38	0.49	3.37	0.51	3.39	0.53	3.36	0.44	3.39	0.50
Female	6279	3.42	0.48	3.16	0.55	3.44	0.49	3.39	0.50	3.38	0.51	3.40	0.52	3.36	0.45	3.40	0.49
Race/Ethnicity																	
White	5427	3.46	0.47	3.20	0.53	3.48	0.49	3.43	0.50	3.42	0.50	3.41	0.53	3.40	0.45	3.42	0.50
Black	2664	3.31	0.49	3.06	0.57	3.36	0.48	3.29	0.49	3.29	0.52	3.33	0.52	3.28	0.45	3.31	0.51
Hispanic/ Latino	1978	3.40	0.47	3.16	0.55	3.39	0.48	3.37	0.48	3.33	0.51	3.43	0.50	3.35	0.44	3.43	0.47
Asian	721	3.51	0.46	3.30	0.49	3.47	0.46	3.46	0.47	3.48	0.47	3.47	0.49	3.45	0.42	3.47	0.45
Multi-Racial	956	3.39	0.48	3.13	0.51	3.42	0.48	3.38	0.49	3.36	0.50	3.35	0.55	3.33	0.44	3.35	0.51
Middle																	
Gender																	
Male	1447	3.15	0.49	2.87	0.58	3.23	0.49	3.15	0.49	3.02	0.51	3.15	0.53	3.10	0.45	3.11	0.50
Female	1820	3.12	0.52	2.75	0.63	3.22	0.50	3.39	0.50	2.95	0.61	3.10	0.55	3.05	0.46	3.08	0.56
Race/Ethnicity																	
White	1532	3.17	0.48	2.83	0.60	3.25	0.51	3.16	0.51	3.00	0.59	3.11	0.54	3.09	0.45	3.12	0.56
Black	761	3.04	0.49	2.73	0.59	3.19	0.45	3.07	0.47	2.93	0.57	3.08	0.51	3.01	0.43	3.02	0.53
Hispanic/ Latino	536	3.19	0.53	2.81	0.65	3.21	0.49	3.18	0.50	3.01	0.60	3.18	0.55	3.10	0.46	3.13	0.54
Asian	178	3.27	0.54	3.01	0.56	3.27	0.52	3.24	0.50	3.16	0.52	3.26	0.51	3.21	0.47	3.22	0.53
Multi-Racial	260	3.02	0.54	2.67	0.63	3.18	0.49	3.06	0.56	2.84	0.68	3.03	0.57	2.97	0.46	3.00	0.62
High																	
Gender																	
Male	466	3.12	0.52	2.92	0.58	3.23	0.53	3.11	0.58	3.07	0.61	3.05	0.57	3.09	0.49	3.10	0.64
Female	631	3.04	0.50	2.77	0.58	3.18	0.53	3.01	0.58	2.93	0.61	2.95	0.54	2.98	0.46	2.99	0.60
Race/Ethnicity																	

White	671	3.11	0.51	2.89	0.59	3.22	0.55	3.08	0.62	3.03	0.66	3.00	0.58	3.06	0.50	3.05	0.65
Black	236	2.96	0.52	2.71	0.57	3.14	0.51	2.98	0.53	2.87	0.53	2.94	0.55	2.94	0.44	2.97	0.57
Hispanic/ Latino	72	3.15	0.46	2.89	0.55	3.27	0.48	3.19	0.54	3.09	0.57	3.13	0.45	3.12	0.45	3.17	0.57
Asian	55	3.11	0.45	2.77	0.56	3.13	0.42	3.05	0.45	2.91	0.49	3.06	0.45	3.01	0.38	3.00	0.54
Multi-Racial	63	3.07	0.48	2.68	0.55	3.19	0.52	2.94	0.54	2.95	0.56	2.97	0.53	2.94	0.41	2.95	0.60

Note. *Is not calculated into Total Score.

Table IV.9

Means and Standard Deviations as a Function of Grade, Gender, and Race/Ethnicity (*DSCS–H*)

		Teacher-Student Relations		Student-Student Relations		Clarity		Fairness		School Safety		Teacher-Home Communications		Total School Climate		Parent Satisfaction *	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre-K	66	3.47	0.51	3.22	0.58	3.46	0.56	3.48	0.51	3.47	0.58	3.46	0.57	3.40	0.50	3.51	0.45
K	1470	3.46	0.46	3.23	0.49	3.45	0.49	3.43	0.48	3.41	0.49	3.44	0.50	3.41	0.43	3.45	0.47
1	1871	3.44	0.48	3.21	0.52	3.45	0.49	3.40	0.50	3.40	0.50	3.42	0.52	3.40	0.45	3.42	0.49
2	1855	3.42	0.47	3.17	0.53	3.43	0.48	3.39	0.50	3.37	0.51	3.39	0.53	3.36	0.45	3.40	0.50
3	2069	3.40	0.48	3.15	0.54	3.42	0.48	3.37	0.48	3.36	0.51	3.39	0.51	3.35	0.43	3.39	0.49
4	1993	3.39	0.49	3.12	0.56	3.42	0.49	3.36	0.50	3.35	0.52	3.35	0.54	3.33	0.46	3.35	0.52
5	1631	3.40	0.49	3.10	0.57	3.42	0.49	3.36	0.50	3.35	0.52	3.37	0.52	3.33	0.45	3.36	0.51
6	1347	3.17	0.48	2.84	0.58	3.24	0.48	3.18	0.48	3.02	0.56	3.13	0.54	3.10	0.43	3.14	0.52
7	892	3.12	0.51	2.78	0.62	3.21	0.49	3.12	0.50	2.97	0.60	3.12	0.53	3.06	0.46	3.07	0.57
8	815	3.10	0.54	2.75	0.63	3.21	0.52	3.11	0.54	2.92	0.64	3.09	0.54	3.03	0.48	3.05	0.60
9	246	3.20	0.52	2.99	0.59	3.34	0.53	3.28	0.56	3.17	0.64	3.17	0.59	3.19	0.50	3.26	0.61
10	323	3.05	0.50	2.79	0.56	3.19	0.50	3.01	0.56	2.95	0.61	2.95	0.53	2.99	0.46	3.02	0.59
11	216	3.08	0.49	2.82	0.57	3.17	0.53	3.04	0.57	2.95	0.58	2.98	0.54	3.02	0.44	3.00	0.61
12	248	2.99	0.49	2.75	0.61	3.11	0.54	2.91	0.59	2.90	0.60	2.90	0.54	2.92	0.46	2.85	0.62

Note. *Is not calculated into Total Score.

Concurrent Validity

At the school-wide level, using aggregated scores across all respondents within each school, we examined correlations between DSCS−H scores, suspension and expulsion rates, and academic achievement. Data for suspensions/expulsions and academic achievement were taken from each school's "school profiles" website, which is maintained by the Delaware Department of Education. Data are for the 2014-2015 school year. Suspension/expulsion data consist of the percentage of students (non-duplicated count) suspended or expelled that school year. Academic achievement scores consist of the percentage of students passing the state's examination of the standards of learning in English/Language Arts and Mathematics. Because only eight high schools reported results of the home survey, correlations are not reported for high school.

Table IV.10 shows correlations of DSCS-H scores with academic achievement and suspensions/expulsions. As seen in the table, across the two grade levels, the total scale score correlated from .67 to .77 with school-level indices of academic achievement and from -.52 to -.63 with school-level suspensions and expulsions.

Table IV.10

Correlations between School Climate and Academic Achievement and Suspensions/Expulsions (*DSCS−H*)

	Elementary Schools[a]			Middle Schools[b]		
	ELA	Math	S/E	ELA	Math	S/E
Teacher-Student Relations	.720	.677	-.532	.727	.727	-.623
Student-Student Relations	.812	.769	-.658	.825	.793	-.716
Clarity of Expectations	.726	.688	-.505	.704	.703	-.579
Fairness of Rules	.704	.665	-.506	.658	.643	-.603
School Safety	.781	.730	-.600	.739	.677	-.644
Teacher-Home Communication	.564	.530	-.400	.658	.662	-.529
Total School Climate	.709	.675	-.517	.766	.751	-.625
Parent Satisfaction[d]	.682	.655	-.504	.705	.684	-.636

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions. All *p*'s < .001, one-tailed.
[a] *n* = 69 schools, [b] *n* = 22 schools
[d] Not included in Total School Climate Score.

Delaware Bullying Victimization Scale–Home (DBVS–H)

The same methods used for the DBVS-S were used in the analyses of the DBVS-H, including for the CFA, as detailed in Chapter 2.

Confirmatory Factor Analyses

As noted above, the same CFA methods used for the DBVS-S were employed for the DBVS-H. This included group mean centering, thereby producing ICCs of zero for each item. The ICCs on the factor scores of DBVS-H in full sample ranged from .01 (Social Bullying Victimization) to .02 (Verbal Bullying Victimization, Physical Bullying Victimization) and the total score of DBVS-H in full sample was .02.

As conducted for the DBVS-S, a second-order model with one higher-order factor (total bullying victimization) and three lower-order factors (verbal, physical, and social/relational bullying) was proposed. Alternative models also were tested. For testing measurement invariance across groups based on the student's grade level, gender, and race/ethnicity, five steps were followed, as recommended by Chen and colleagues (Chen, Sousa, & West, 2005): (a) configural invariance (Model 1); (b) first-order factor loading invariance (Model 2); (c) first- and second-order factor loading invariance (Model 3); (d) first- and second-order factor loading and intercepts of measured variables invariance (Model 4); and (e) first- and second-order factor loadings, and intercepts of measured variables and first-order factors invariance (Model 5).

Results of Confirmatory Factor Analyses

Comparing second-order model with alternative models. As shown in Table IV.11, the proposed three-factor second-order model yielded adequate fit indices, whereas the one-factor model yielded poor fit statistics. Although the bifactor model yielded adequate fit indices, it failed to converge on the Hispanic group in the later multi-group analysis. When a three-factor model was tested, each of the fit indices for this model was the same as the three-factor second-order model because the model was just identified. As the total scores of bullying victimization based on the three subscale scores were used, the three-factor second-order model was selected as the final model.

Table IV.11					
Fit Statistics for Models Tested (DBVS-H)					
Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	7265.16*	44	.714	.086	.014
Three-factor model	1217.31*	51	.938	.044	.052
Second-order model	1217.31*	51	.938	.044	.052
Bifactor model	505.99*	42	.975	.027	.036
Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =8,367. Models were tested on approximately one half of sample, randomly selected.					
*p < .001.					

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: χ^2 = 1250.17 (51, *N* =8,377), p < .001; CFI = .932, RMSEA = .053, and SRMR = .045. The completely standardized factor loadings were compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table IV.12, the indicators had generally similar factor loadings in the two randomly-split samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table IV.13.

Table IV.12						
Confirmatory Factor Analysis of the Second-order Model (DBVS-H)						
	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: Bullying Victimization						
Verbal Bullying Victimization	0.93	0.00	236.77	0.93	0.00	229.76
Physical Bullying Victimization	0.91	0.01	138.82	0.91	0.01	148.35
Social Bullying Victimization	0.95	0.01	164.85	0.96	0.01	185.86
First-order Factor 1: Verbal Bullying Victimization						
1. My child was teased by someone saying hurtful things to him/her.	0.82	0.01	124.44	0.82	0.01	121.58
4. A student said mean things to my child.	0.87	0.01	183.56	0.86	0.01	169.29
7. My child was called names he or she didn't like.	0.88	0.00	202.91	0.88	0.00	209.22
10. Hurtful jokes were made up about my child.	0.84	0.01	127.77	0.84	0.01	124.60
First-order Factor 2: Physical Bullying Victimization						
2. My child was pushed or shoved on purpose.	0.76	0.01	94.00	0.76	0.01	95.05
5. My child was hit or kicked and it hurt.	0.79	0.01	79.52	0.79	0.01	91.77
8. A student stole or broke something of my child's on purpose.	0.75	0.01	62.64	0.75	0.01	63.78
11. A student threatened to harm my child.	0.81	0.01	94.33	0.82	0.01	100.45
First-order Factor 3: Social Bullying Victimization						
3. Students left my child out of things to make him/her feel badly.	0.76	0.01	78.10	0.76	0.01	85.55
6. A student told/got others not to like my child.	0.87	0.01	154.18	0.87	0.01	160.07
9. A student got others to say mean things about my child.	0.89	0.01	169.63	0.89	0.01	178.19
12. Students told another student not to be friends with my child because the other students didn't like my child.	0.87	0.01	137.03	0.86	0.01	122.55
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table IV.13

Fit Statistics Between Groups for Second-order Model (DBVS-H)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	16,751	2,367.73*	51	.943	.044	.052
Elementary	12,216	1,662.13*	51	.941	.047	.051
Middle	3,404	642.15*	51	.940	.042	.058
High	1,131	362.49*	51	.917	.047	.073
Male	7,676	1,169.11*	51	.933	.048	.053
Female	9,075	1.211.39*	51	.943	.041	.050
White	7,835	1.287.51*	51	.942	.048	.056
Black	3,870	617.56*	39	.937	.042	.054
Hispanic	2,740	376.98*	51	.918	.049	.048
Asian	983	192.36*	51	.920	.051	.053
Multi-Racial	1,323	314.91*	51	.918	.053	.063

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *p <.001

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle, and high school grade levels yielded fit statistics that suggested adequate model fit (see Table IV.14). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 309.66 (Δdf = 18), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 29.04 (Δdf = 4), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated invariance of intercepts across grade level: Satorra–Bentler scaled chi-square difference test = 38.05 (Δdf = 8), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 7.13 (Δdf = 5), p = ns, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female parents yielded fit statistics that suggested adequate model fit (see Table IV.14). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 34.29 (Δdf = 9), p < .001,

ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 91.17 (Δ*df* = 2), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loading and intercepts (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 33.24 (Δ*df* = 9), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 10.55 (Δ*df* = 2), $p < .05$, ΔCFI < .01.

Measurement invariance across race/ethnicity. A model testing the configural invariance across parents with five race/ethnicity backgrounds (i.e., White, African-American, Hispanic, Asian, and Other) yielded fit statistics that suggested adequate model fit (see Table IV.14). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 94.06 (Δ*df* = 36), $p < .001$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race: Satorra–Bentler scaled chi-square difference test = 5.42 (Δ*df* = 8), *p* =ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race: Satorra–Bentler scaled chi-square difference test = 33.49 (Δ*df* = 36), *p* = *ns*, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race: Satorra–Bentler scaled chi-square difference test = 7.62 (Δ*df* = 11), *p* = *ns*, ΔCFI < .01.

Table IV.14

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DBVS-H)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade level					
Model 1	2,957.76*	153	.935	.046	.057
Model 2	3,270.11*	171	.928	.052	.057
Model 3	3,282.20*	175	.928	.054	.056
Model 4	3,617.72*	193	.921	.054	.056
Model 5	3,711.11*	198	.919	.054	.056
Gender					
Model 1	2,377.72*	102	.938	.044	.052
Model 2	2,397.25*	111	.938	.046	.050
Model 3	2,499.41*	113	.935	.055	.050
Model 4	2,697.56*	122	.930	.055	.050
Model 5	2,741.68*	124	.929	.055	.050
Race/Ethnicity					
Model 1	2,676.67*	255	.932	.047	.053
Model 2	2,662.66*	291	.933	.052	.049
Model 3	2,636.06*	299	.934	.052	.048
Model 4	2,951.95*	335	.926	.052	.048
Model 5	3,048.71*	346	.924	.052	.048

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.

*p <.001

Correlations among Factors

For all parents/guardians combined, verbal bullying correlated .68 with physical bullying and .79 with social/relational bullying. Physical bullying correlated .69 with social/relational bullying.

Reliability

As shown in Table IV.15, for all parents combined across grade levels, internal consistency coefficients for each of the three subscales ranged from .80 to .91. The reliability of scores for each of the three subscales also was computed for each subgroup (5 racial–ethnic groups x 2 genders x 3 grade levels). Coefficients ranged from = .79 (Physical Bullying for parents of elementary, female, and Hispanic/Latino students) to .94 (Verbal bullying for parents of middle school students).

There were negligible differences between the alpha coefficients for parents of elementary school (range .79 to .90), middle school (range .81 to .94), and high school (range .89 to .93) students; between parents of White (range .81 to .91), Black (range .80 to .92), Hispanic (range .79 to .90), Asian (.83 to .90), and Multi-Racial (range .80 to .92) students; and between parents of boys (range .82 to .91) and girls (range 79 to .91).

Table IV.15

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DBVS-H)

	Verbal	Physical	Social/ Relational	Total
Full Sample	.91	.80	.90	.94
Grade Level				
Elementary	.90	.79	.89	.93
Middle	.94	.81	.91	.95
High	.93	.89	.93	.96
Gender				
Male	.91	.82	.89	.94
Female	.91	.79	.90	.94
Race/Ethnicity				
White	.91	.81	.91	.94
Black	.92	.80	.89	.94
Hispanic/ Latino	.90	.79	.86	.93
Asian	.90	.83	.87	.93
Multi-Racial	.92	.80	.91	.94

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table IV.16. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table IV.17 shows those scores as a function of grades 3-12.

A 3 (grade level) X 5 (racial/ethnic group) X 2 (gender) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in scores on the three subscales. Statistically significant overall main effects were found for grade level, F (6, 31498) = 6.54, $p < .001$, partial $\eta^2 = .001$; gender, F (3, 15748) = 12.64, $p < .001$, partial $\eta^2 = .002$; and race/ethnicity, F (12, 47250) = 5.83, $p < .001$, partial $\eta^2 = .001$.

Interaction effects were not statistically significant for grade level X gender, gender X race/ethnicity, or grade level X gender X race/ethnicity. The only significant interaction effect was for grade level X race/ethnicity, F (24, 47250) = 2.30, $p < .001$, partial $\eta^2 = .001$.

Because of the very small effect sizes, each of the differences reported above should be interpreted as being of little if any practical value. Thus, follow-up comparisons are reported.

Table IV.16

Means and Standard Deviations for Subscale and Scale Scores by Grade Level, Gender, and Race/Ethnicity (DBVS-H)

		Verbal		Physical		Social/ Relational		Total	
	n	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Elementary									
Gender									
Boys	5333	1.58	0.88	1.27	0.54	1.28	0.64	1.37	0.61
Girls	6139	1.64	0.94	1.23	0.51	1.38	0.76	1.41	0.65
Race/Ethnicity									
White	5309	1.67	0.90	1.25	0.50	1.35	0.70	1.41	0.62
Black	2604	1.70	1.02	1.31	0.60	1.38	0.80	1.44	0.72
Hispanic/ Latino	1907	1.43	0.85	1.22	0.54	1.27	0.67	1.30	0.60
Asian	711	1.29	0.59	1.12	0.37	1.15	0.42	1.18	0.41
Multi-Racial	941	1.68	0.92	1.29	0.51	1.37	0.71	1.44	0.63
Total	11472	1.61	0.91	1.25	0.53	1.33	0.71	1.39	0.63
Middle									
Gender									
Boys	1423	1.71	1.13	1.33	0.71	1.35	0.83	1.45	0.82
Girls	1805	1.71	1.12	1.26	0.59	1.43	0.88	1.46	0.78
Race/Ethnicity									
White	1516	1.78	1.16	1.31	0.65	1.41	0.87	1.49	0.82
Black	747	1.67	1.08	1.29	0.64	1.36	0.80	1.42	0.75
Hispanic/ Latino	531	1.56	1.02	1.25	0.60	1.35	0.83	1.38	0.75
Asian	178	1.43	0.91	1.11	0.28	1.22	0.64	1.25	0.55
Multi-Racial	256	1.95	1.30	1.44	0.84	1.57	1.09	1.63	0.98
Total	3228	1.71	1.13	1.29	0.64	1.39	0.86	1.45	0.63
High									
Gender									
Boys	461	1.41	0.95	1.22	0.71	1.23	0.77	1.28	0.77
Girls	619	1.50	0.95	1.19	0.56	1.31	0.81	1.33	0.69
Race/Ethnicity									
White	656	1.44	0.91	1.18	0.57	1.25	0.75	1.28	0.67
Black	232	1.58	1.05	1.26	0.74	1.38	0.92	1.41	0.83
Hispanic/ Latino	74	1.17	0.49	1.08	0.28	1.07	0.22	1.11	0.29
Asian	55	1.46	1.12	1.35	0.90	1.32	1.00	1.38	0.98
Multi-Racial	63	1.54	1.14	1.26	0.68	1.44	0.95	1.41	0.88
Total	1080	1.46	0.95	1.20	0.62	1.28	0.79	1.31	0.73

Table IV.17

Means and Standard Deviations for Subscale and Scale Scores for Grades 3-12 (DBVS-H)

		Verbal		Physical		Social/ Relational		Total	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre-K	66	1.35	0.56	1.24	0.47	1.17	0.40	1.25	0.44
K	1534	1.50	0.74	1.23	0.43	1.22	0.53	1.31	0.48
1	1960	1.57	0.84	1.26	0.54	1.31	0.68	1.37	0.61
2	1959	1.58	0.88	1.25	0.50	1.32	0.67	1.38	0.60
3	2183	1.65	0.93	1.25	0.54	1.37	0.74	1.41	0.64
4	2074	1.67	1.00	1.27	0.57	1.39	0.80	1.44	0.71
5	1696	1.68	1.05	1.24	0.56	1.36	0.77	1.42	0.71
6	1437	1.71	1.11	1.27	0.60	1.38	0.85	1.45	0.77
7	929	1.74	1.17	1.31	0.68	1.40	0.87	1.47	0.83
8	862	1.69	1.11	1.30	0.68	1.41	0.88	1.45	0.80
9	250	1.43	0.92	1.15	0.49	1.18	0.61	1.25	0.61
10	347	1.43	0.87	1.20	0.61	1.26	0.75	1.29	0.67
11	224	1.41	0.91	1.18	0.56	1.26	0.77	1.29	0.70
12	259	1.57	1.09	1.27	0.79	1.41	0.99	1.42	0.90

Concurrent Validity

Table IV.18 shows correlations of DBVS-H Bullying Victimization scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level. Scores were not included for high schools because of small sample size (n = 8). As seen in the table, across both elementary and middle schools bullying victimization scores correlated moderately -.493 to -.704 with school-level indices of academic achievement. However, correlations between bullying victimization scores and suspension/expulsions varying greatly between grade levels: Whereas correlations were significant in elementary schools (.629 to .713), they were not in middle schools (.170 to .291).

Table IV.18

Correlations between Bullying Victimization and Academic Achievement and Suspensions/Expulsions (DBVS-H)

	Elementary Schools[a]			Middle Schools[b]		
	ELA	Math	S/E	ELA	Math	S/E
Verbal Bullying	-.555**	-.541**	.714**	-.493**	-.499**	.223
Physical Bullying	-.701**	-.682**	.685**	-.704**	-.610**	.291
Social/ Relational Bullying	-.653**	-.632**	.631**	-.560**	-.550**	.267
Total Bullying	-.636**	-.624**	.712**	-.543**	-.530**	.170

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions.

[a] n = 69 schools, [b] n = 22 schools

*p < .05. **p < .01. One tailed.

Delaware Student Engagement Scale-Home (DSES-H)

The same methods (and sample) used above for the DBVS-H were used for the DSES-H.

The ICCs on the factor scores of the DSES-H in full sample ranged from .02 (Behavioral School Engagement) to .12 (Emotional School Engagement) and the ICC of the total School Engagement score was .06. Thus, in conducting CFA individual item responses were centered on the school mean by utilizing the centering command in Mplus.

As conducted above for the DSBV-H, a second-order model with one higher-order factor (total school engagement) and three lower-order factors (behavioral, cognitive, and emotional) was proposed. Alternative models, as noted below, also were tested.

Results of Confirmatory Factor Analyses

Comparing second-order model with alternative models. As shown in Table IV.19, the proposed three-factor second-order model yielded adequate fit indices, whereas a one-factor model yielded poor fit statistics. The bifactor model failed to converge. When a three-factor model was tested, each of the fit indices was the same as for the second-order model because the model was just identified. As the total scores of school engagement based on the three subscale scores were used, the second-order model was selected as the final model.

Table IV.19

Fit Statistics for Models Tested (DSES-H)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	7,265.16*	44	.714	.086	.14
Three-factor model	1,289.96*	41	.950	.037	.06
Second-order model	1,289.96*	41	.950	.037	.06

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =8,367. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second randomly-split approximately half of the sample also generated robust fit statistics for the second-order model: $\chi^2 = 1251.09$ (41, N =8,367), $p < .001$; CFI = .952, RMSEA = .059, and SRMR = .036. The completely standardized factor loadings were compared to ensure that there were no large differences across the randomly selected samples. As illustrated in Table IV.20, the indicators had generally similar factor loadings in the two samples. Because no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table IV.21.

Table IV.20						
Confirmatory Factor Analysis of the Second-order Model of DSES-H						
	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: School Engagement						
Behavioral Engagement	1.01	.01	139.93	1.01	.01	148.41
Cognitive Engagement	0.96	.01	142.31	.96	.01	155.69
Emotional Engagement	0.65	.02	37.44	.66	.02	35.36
First-order Factor 1: Behavioral Engagement						
1. I pay attention in class.	.79	.01	129.77	.79	.01	127.51
4. I follow the rules at school.	.81	.01	121.90	.81	.01	122.35
7. When I don't do well, I work harder.	.74	.01	78.85	.74	.01	82.25
10. I stay out of trouble at school.	.75	.01	73.20	.75	.01	72.52
First-order Factor 2: Cognitive Engagement						
2. I try my best in school.	.82	.01	126.68	.83	.01	124.52
5. I turn in my homework on time.	.74	.01	87.40	.74	.01	81.66
8. I get good grades in school.	.75	.01	92.80	.75	.01	90.95
First-order Factor 3: Emotional Engagement						
3. I feel happy in school.	.87	.01	155.03	.87	.01	138.07
6. My school is a fun place to be.	.86	.01	128.07	.85	.01	153.89
9. I like students who go to this school.	.72	.01	78.75	.74	.01	78.42
13. I like this school.	.85	.01	123.86	.85	.01	154.03
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table IV.21						
Fit Statistics Between Groups for Second-order Model (DSES-H)						
Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	16,741	2,338.311*	41	.949	.035	.058
Elementary	12,207	1,586.685*	41	.957	.033	.056
Middle	3,404	741.4*	41	.943	.040	.071
High	1,130	285.057*	41	.939	.040	.073
Male	7,665	1,496.418*	41	.943	.038	.068
Female	9,076	1,113.81*	41	.959	.034	.054
White	7,840	1,708.097*	41	.945	.037	.072
Black	3,862	621.333*	41	.950	.039	.061
Hispanic	2,732	231.881*	41	.972	.030	.041
Asian	985	160.52*	41	.962	.039	.054
Multi-Racial	1,322	201.131*	41	.961	.038	.054
Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *p <.001						

Measurement invariance across grade level. A model testing the configural invariance across elementary, middle and high schools yielded fit statistics that suggested adequate model fit (see Table IV.22). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 171.76 (Δdf = 16), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings across grade level: Satorra–Bentler scaled chi-square difference test = 98.58 (Δdf = 4), p < .001, ΔCFI < .01. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts across grade level: Satorra–Bentler scaled chi-square difference test = 27.22 (Δdf = 6), p < .05, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors across grade level: Satorra–Bentler scaled chi-square difference test = 19.50 (Δdf = 5), p < .05, ΔCFI < .01.

Measurement invariance across gender. A model testing the configural invariance across male and female parents yielded fit statistics that suggested adequate model fit (see Table IV.22). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 28.80 (Δdf =

8), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across gender: Satorra–Bentler scaled chi-square difference test = 0.18 ($\Delta df = 2$), p = ns, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated invariance of intercepts of measured variables across gender: Satorra–Bentler scaled chi-square difference test = 13.79 ($\Delta df = 7$), $p = ns$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 61.90 ($\Delta df = 5$), $p < .001$, $\Delta CFI < .01$.

Measurement invariance across race/ethnicity. A model testing the configural invariance across parents with five race/ethnicity backgrounds (i.e., White, African-American, Hispanic, Asian, and Other) yielded fit statistics that suggested adequate model fit (see Table IV.22). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated that there was invariance of first-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 77.71 ($\Delta df = 32$), $p < .001$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated that there was invariance of second-order factor loadings across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 7.28 ($\Delta df = 8$), $p = ns$, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated that there was invariance of intercepts of measured variables across race: Satorra–Bentler scaled chi-square difference test = 18.08 ($\Delta df = 28$), p = ns, $\Delta CFI < .01$. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) indicated that there was invariance of first-order latent factors across race/ethnicity: Satorra–Bentler scaled chi-square difference test = 17.28 ($\Delta df = 11$), p = ns, $\Delta CFI < .01$.

Table IV. 22

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Grade Level, Gender, and Race/Ethnicity (DSES-H)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Grade levels					
Model 1	2,975.18*	125	.952	.035	.064
Model 2	3,179.39*	141	.949	.038	.062
Model 3	3,276.06*	145	.947	.044	.062
Model 4	3,588.99*	159	.942	.044	.062
Model 5	3,701.57*	164	.941	.044	.062
Gender group					
Model 1	2,617.97*	83	.951	.036	.060
Model 2	2,714.11*	91	.949	.036	.059
Model 3	2,720.25*	93	.949	.036	.058
Model 4	2,923.21*	100	.945	.036	.058
Model 5	2,981.42*	102	.944	.036	.058
Race/Ethnicity group					
Model 1	2,762.49*	209	.952	.037	.060
Model 2	2,892.12*	241	.950	.038	.057
Model 3	2,913.43*	249	.950	.039	.057
Model 4	3,238.46*	277	.944	.039	.057
Model 5	3,366.55*	288	.942	.039	.057

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2= Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.

*p <.001

Correlations among Factors

For all parents combined, behavioral engagement correlated .81 with cognitive engagement and .56 with emotional engagement. Cognitive engagement correlated .56 with emotional engagement. The total score correlate .90 with behavioral engagement, .87 with cognitive engagement, and .85 with emotional engagement.

Reliability

As shown in Table IV.23, for all parents combined across grade levels, internal consistency coefficients were .85 for Behavioral Engagement, .82 for Cognitive Engagement, .84 for Emotional Engagement, and .92 for Total Engagement. The reliability of scores for each of the subscales also was computed for each subgroup (5 racial–ethnic groups x 2 genders x 3 grade levels). Coefficients ranged from .79 to .86.

Table IV. 23

Reliability Coefficients by Grade Level, Gender, and Race/Ethnicity (DSES-H)

	Behavioral Engagement	Cognitive Engagement	Emotional Engagement	Total Engagement
Full Sample	.85	.82	.84	.92
Grade Level				
Elementary	.86	.80	.85	.92
Middle	.85	.85	.80	.91
High	.84	.84	.82	.89
Gender				
Boys	.84	.81	.83	.91
Girls	.86	.82	.84	.92
Race/Ethnicity				
White	.86	.83	.86	.92
Black	.85	.80	.83	.91
Hispanic	.83	.79	.79	.91
Asian	.86	.82	.85	.93
Multi-Racial	.86	.81	.83	.91

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table IV.24. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table IV.25 shows those scores as a function of grades 3-12.

Because of the very small effect sizes, each of the differences reported above should be interpreted as being of little if any practical value. Thus, follow-up comparisons are reported.

A 3 (grade level) X 2 (gender) X 4 (race/ethnicity) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences subscale scores between groups.

Statistically significant overall main effects were found for grade level, F (6, 31570) = 155.93, $p < .001$, partial $\eta^2 = .029$; gender, F (3, 15784) = 42.85, $p < .001$, partial $\eta^2 = .008$; and race/ethnicity, F (12, 47358) = 13.74, $p < .001$, partial $\eta^2 = .003$.

Except for gender x race, all interaction effects also were statistically significant: grade level X gender, F (6, 31570) = 12.86, $p < .001$, partial $\eta^2 = .002$; grade level X race/ethnicity, F (24, 47358) = 4.40, $p < .001$, partial $\eta^2 = .002$; and grade level X gender X race/ethnicity, F (24, 47358) = 2.09, $p < .001$, partial $\eta^2 = .001$. Because of the very small effect sizes, with the exception of the main effect for grade level, the differences should be interpreted as being of little if any practical value. Thus, follow-up comparisons are only reported for the grade level main effect.

Although statistically significant grade level differences were found on each of the three subscales ($p < .001$), the effect sizes were very small, with partial η^2 of .001 for behavioral engagement and .006 for cognitive engagement. However, for emotional engagement, differences were statistically significant and the effect size was larger: $F = 108.84$, partial $\eta^2 = .042$. Bonferroni follow-up tests for scores on emotional engagement showed that elementary students scored substantially higher than middle school and high school students (see means in Table IV.23). Although high school students reported being less emotionally engaged than middle school students, the differences were trivial.

Table IV. 24

Means and Standard Deviations for Subscale and Scale Scores by Grade Level, Gender, and Race/Ethnicity (DSES-H)

		Behavioral Engagement		Cognitive Engagement		Emotional Engagement		Total Engagement	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Elementary									
Gender									
Boys	5313	3.33	0.49	3.40	0.50	3.36	0.50	3.36	0.44
Girls	6175	3.47	0.49	3.51	0.49	3.43	0.51	3.47	0.45
Race/Ethnicity									
White	5369	3.42	0.49	3.50	0.48	3.42	0.51	3.44	0.45
Black	2619	3.31	0.51	3.37	0.52	3.33	0.50	3.34	0.46
Hispanic	1853	3.43	0.47	3.47	0.47	3.38	0.49	3.41	0.43
Asian	706	3.55	0.44	3.58	0.44	3.54	0.46	3.56	0.41
Multi-Racial	941	3.36	0.51	3.43	0.50	3.36	0.50	3.38	0.45
Total	11488	3.40	0.49	3.46	0.49	3.40	0.50	3.42	0.45
Middle									
Gender									
Boys	1421	3.28	0.51	3.24	0.60	3.12	0.53	3.21	0.47
Girls	1808	3.43	0.51	3.42	0.55	3.17	0.56	3.34	0.47
Race/Ethnicity									
White	1526	3.41	0.51	3.38	0.60	3.13	0.57	3.31	0.49
Black	749	3.27	0.50	3.23	0.57	3.12	0.50	3.21	0.44
Hispanic	520	3.38	0.50	3.34	0.53	3.20	0.53	3.31	0.45
Asian	177	3.48	0.49	3.54	0.52	3.30	0.53	3.43	0.46
Multi-Racial	257	3.31	0.55	3.31	0.58	3.10	0.54	3.24	0.46
Total	3229	3.37	0.51	3.34	0.58	3.15	0.55	3.28	0.47
High									
Gender									
Boys	452	3.30	0.47	3.19	0.57	3.11	0.55	3.20	0.45
Girls	628	3.39	0.49	3.35	0.55	3.04	0.60	3.25	0.46
Race/Ethnicity									
White	657	3.36	0.48	3.30	0.58	3.08	0.58	3.24	0.46
Black	234	3.31	0.49	3.21	0.54	3.05	0.58	3.20	0.46
Hispanic	72	3.37	0.44	3.22	0.62	3.14	0.55	3.24	0.45
Asian	55	3.45	0.48	3.47	0.52	2.98	0.53	3.28	0.42
Multi-Racial	62	3.36	0.50	3.30	0.51	2.99	0.60	3.21	0.44
Total	1080	3.35	0.48	3.28	0.57	3.07	0.58	3.23	0.46

Table IV. 25

Means and standard deviations for subscale and scale scores for grades 3-12 (DSES-H)

		Behavioral Engagement		Cognitive Engagement		Emotional Engagement		Total Engagement	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	1958	3.37	.50	3.47	.49	3.41	.50	3.42	.45
2	1952	3.40	.50	3.45	.50	3.40	.50	3.41	.45
3	2186	3.41	0.48	3.45	0.49	3.39	0.49	3.41	0.44
4	2086	3.43	0.49	3.45	0.50	3.37	0.51	3.41	0.45
5	1696	3.43	0.48	3.45	0.51	3.36	0.52	3.41	0.45
6	1434	3.40	0.49	3.39	0.55	3.20	0.50	3.33	0.44
7	928	3.35	0.54	3.31	0.60	3.12	0.56	3.26	0.48
8	867	3.34	0.52	3.30	0.61	3.08	0.59	3.24	0.50
9	250	3.37	0.51	3.31	0.61	3.20	0.57	3.30	0.49
10	348	3.34	0.46	3.25	0.54	3.07	0.55	3.22	0.43
11	223	3.39	0.46	3.30	0.58	3.04	0.58	3.24	0.46
12	259	3.32	0.49	3.27	0.54	2.95	0.60	3.17	0.45

Concurrent Validity

Table IV.26 shows correlations of DSCS-H Student Engagement scores with academic achievement and suspensions/expulsions. All scores were aggregated at the school level. Scores were not included for high schools because of small sample size (n = 8). As seen in the table, across both elementary and middle schools engagement scores correlated moderately with school-level indices of academic achievement (.623 to .770) and with suspensions/expulsion (-.479 to -. 630).

Table IV.26

Correlations between Student Engagement and Academic Achievement and Suspensions/Expulsions (DSES-H)

	Elementary Schools[a]			Middle Schools[b]			All Schools Combined		
	ELA	Math	S/E	ELA	Math	S/E	ELA	Math	S/E
Behavioral Engagement	.734	.665	-.567	.691	.707	-.621	.669	.649	-.518
Cognitive Engagement	746	663	-.663	.623	.665	-.571	.635	.723	-.647
Emotional Engagement	.752	.708	-.616	.647	.612	-.563	.491	.686	-.784
Total Engagement	.771	.708	-.574	.693	.696	-.630	.609	.743	-.749

Note. ELA= English–Language Arts. S/E = Suspensions and Expulsions. All p's , <.001, one-tailed.
[a] n = 69 schools, [b] n = 22 schools

CHAPTER 5

VALIDITY AND RELIABILITY OF SCALES OF THE SPANISH DELAWARE SCHOOL CLIMATE SURVEY—HOME (SPANISH DSCS-H)

In this chapter we present results of analyses examining the validity and reliability of scores of Spanish versions of the Delaware School Climate Survey–Home (Spanish DSCS–H), Spanish Delaware Bullying Victimization Scale–Home (Spanish DBVS–H), and Delaware Spanish Student Engagement Scale-Home (Spanish DSES-H). As noted previously, all items on the Spanish version are the same as those on the English version. Likewise, the same administrative procedures used for the English version were followed for the Spanish version, with parents/guardians completing the survey using a Scantron paper form sent home with their child or an online Qualtrics version of the survey.

Participants

A total of 1,261 parents/guardians, representing 47 elementary schools in Delaware, completed the Spanish DSCS-H in 2015. Because only 139 parents/guardians of students in middle and high school responded, those grade levels were not included in the analyses. Also deleted were 107 respondents who identified themselves as a racial/ethnic group other than Hispanic and 75 respondents with missing data on one or more of the three demographic variables (i.e., gender, primary language spoken at home, and relation to the student). Deletion of those 321 total respondents resulted in a final sample of 940.

Descriptive information about the sample is presented in Table V.1.

Table V.1	
Demographic Information of the Final Sample (*Spanish DSCS*)	
Student's Gender	
Male	455
Female	485
Primary Language Spoken at Home	
English	444
Spanish	496
Respond's Relation to Students	
Father/Stepfather	182
Mother/Stepmother	752
Other	6

Results of Confirmatory Factor Analyses

The same statistical procedures reported previously for the English version were used for the Spanish version. However, in examining measurement invariance, invariance was examined across gender (of the student) and also across two other groups: those responding English and those responding Spanish as the primary language spoken at home.

Justifying the need for centering of means in the analyses, the ICCs on the factor scores in the full sample ranged from .00 (Clarity of Expectations and Fairness of Rules) to .07 (Teacher-Student Relations), and the ICC of total school climate score was .01.

Comparing six-factor model with alternative models. As shown in Table V.2, and consistent with results of the English version, a second-order model yielded adequate fit indices, whereas a one-factor model yielded poor fit statistics. A bifactor model was tested, but did not converge. Finally, a six-factor correlation model also was tested, and achieved adequate model fit. There was no significant difference of model fit between the six-factor second-order model and the correlation model. Given that the second-order model is more consistent with the theoretical framework of the school climate construct, and the fit indices were adequate, it was chosen as the final model.

Table V.2

Fit Statistics for Models Tested (DSCS-H-Spanish)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	1198.483	275	0.855	0.057	0.085
Six-factor correlation model	763.161	260	0.921	0.046	0.064
Second-order model	812.53	269	0.915	0.048	0.066

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean-Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s = 8,389. Models were tested on approximately one half of sample, randomly selected. **p* < .001.

Confirming fit of final model. As found on the first randomly selected half of the sample, confirmatory factor analyses on the second randomly selected half of the sample also generated robust fit statistics for the second-order model: χ^2 = 668.70 (269, *N* = 470), *p* < .001; CFI = .937, RMSEA = .056, and SRMR = .042. Completely standardized factor loadings were compared to ensure that there were no large differences between the randomly split samples. As illustrated in Table V.3, indicators demonstrated similar factor loadings on the six factors in both halves of the sample. As no appreciable differences in the fit indices or factor loadings were found for the two halves of the sample, all subsequent analyses were run with the full sample. A summary of the fit statistics for the second-order model with full sample and subsamples is presented in Table V.4.

Table V.3						
Confirmatory Factor Analysis of Second-order Model for Spanish DSCS-H						
	Sample 1			Sample 2		
Factor and Items	Loading	*SE*	*z*	Loading	*SE*	*z*
Second-order Factor: School Climate						
Factor 1: Teacher-Student Relations	1.00	0.01	86.55	1.00	0.01	178.21
Factor 2: Student-Student Relations	0.81	0.02	33.31	0.82	0.03	33.08
Factor 3: Clarity of Expectations	0.97	0.01	70.72	0.97	0.01	68.80
Factor 4: Fairness of Rules	0.99	0.01	145.27	0.99	0.01	164.69
Factor 5: Safety	0.92	0.03	29.70	0.93	0.02	38.99
Factor 6:Teacher-Home Communication	0.94	0.02	49.72	0.95	0.01	94.33
Factor 1: Teacher-Student Relations						
2. Teachers treat students of all races with respect.	0.78	0.02	36.51	0.79	0.03	26.76
7. Teachers care about their students.	0.81	0.02	39.10	0.83	0.02	57.10
17. Teachers listen to students when they have problems.	0.82	0.02	36.28	0.84	0.02	57.76
22. Adults who work here care about the students.	0.78	0.02	33.47	0.82	0.02	45.17
27. Teachers like their students.	0.85	0.02	37.47	0.87	0.02	48.36
Factor 2: Student-Student Relations						
11. Students are friendly with each other.	0.81	0.04	21.51	0.84	0.03	28.42
16. Students care about each other.	0.85	0.03	32.92	0.87	0.03	34.27
21. Students respect others who are different	0.85	0.03	32.68	0.81	0.03	25.90
26. Students treat each other with respect.	0.83	0.02	38.82	0.82	0.02	34.32
31. Students get along with each other.	0.87	0.02	48.63	0.87	0.03	34.39
Factor 3: Clarity of Expectations						
5. Rules are made clear to students.	0.81	0.03	26.92	0.82	0.02	34.66
10. Students know how they are expected to act.	0.83	0.02	35.95	0.81	0.03	32.24
15. Students know what the rules are.	0.82	0.03	26.75	0.83	0.02	39.39
20. It is clear how students are expected to act.	0.85	0.03	31.87	0.89	0.02	57.26
Factor 4: Fairness of Rules						
3. The school rules are fair.	0.82	0.02	37.02	0.82	0.02	35.57

8. The consequences of breaking rules are fair.	0.82	0.02	38.01	0.80	0.03	31.04
18. The school's Code of Conduct is fair.	0.86	0.02	39.20	0.86	0.02	47.57
28. Classroom rules are fair.	0.86	0.02	39.42	0.87	0.01	71.36
Factor 5: Safety						
4. Students are safe in the hallways.	0.79	0.02	44.34	0.80	0.02	41.99
13. Students feel safe.	0.83	0.03	30.69	0.85	0.02	38.83
19. Students know they are safe.	0.89	0.03	35.51	0.87	0.02	35.56
Factor 6:Teacher-Home Communication						
1. Teachers listen to the concerns of parents.	0.73	0.04	16.85	0.73	0.04	19.49
23. Teachers show respect toward parents.	0.86	0.02	35.47	0.85	0.02	51.78
24. Teachers work closely with parents to help students when they have problems.	0.89	0.02	46.88	0.89	0.02	49.24
25. Teachers do a good job communicating with parents.	0.87	0.03	33.75	0.85	0.03	28.31
Note. Loading = standardized factor loading; *SE* = standard error; *z* = robust *z* score.						

Table V.4

Fit Statistics Between Groups for Second-order Model (Spanish DSCS-H)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	940	732.81*	269	0.931	0.043	0.056
Male	455	742.89*	269	0.924	0.046	0.062
Female	485	508.48*	269	0.921	0.049	0.060
Father	182	1013.27*	269	0.883	0.060	0.070
Mother	752	727.78*	269	0.924	0.045	0.061
English	444	681.09*	269	0.915	0.050	0.062
Spanish	496	732.81*	269	0.935	0.042	0.056

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across students' gender. A model testing the configural invariance across respondents who reported their child to be either male or female yielded adequate model fit (see Table V.5). The difference between test statistics for the invariance of the first-order factor loadings (Model 2 in Table V.5) and the configural invariance (Model 1) indicated invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 15.44 (Δdf = 19), p = ns , ΔCFI < .01. The difference between test statistics for the models

testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) also indicated invariance of the second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 5.82 ($\Delta df = 5$), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables (Model 4) and invariance of first and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 16.79 ($\Delta df = 19$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = 2.19 ($\Delta df = 5$), p = ns, ΔCFI < .01.

Measurement invariance across primary language spoken at home being either English or Spanish. A model testing the configural invariance across groups reporting English versus Spanish as the primary language spoken at home yielded adequate fit statistics (see Table V.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) indicated that there was invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 18.10 ($\Delta df = 19$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 2.83 ($\Delta df = 5$), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loading and intercepts of measured variables (Model 4) and invariance of first- and second-order factor loadings (Model 3) indicated invariance: Satorra–Bentler scaled chi-square difference test = 24.38 ($\Delta df = 19$), $p = ns$, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loadings and intercepts (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = 12.72 ($\Delta df = 5$), p = ns, ΔCFI < .01.

Measurement invariance across respondent's relation to student. A model testing the configural invariance across groups reporting being either the child's father/stepfather or mother/stepmother yielded fit statistics that suggested adequate model fit (see Table V.5). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) indicated invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 11.73 ($\Delta df = 19$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 7.56 ($\Delta df = 5$), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables (Model 4) and invariance first- and second-

order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 18.27 (Δdf = 19), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = -0.34 (Δdf = 5), p = ns, ΔCFI < .01.

Table V.5

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Gender, Primary Language Spoken at Home, and Relations to the Student (Spanish DSCS-H)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Student's Gender					
Model 1	1479.69*	538	0.922	0.048	0.061
Model 2	1509.64*	557	0.921	0.048	0.060
Model 3	1519.41*	562	0.921	0.048	0.060
Model 4	1570.18*	581	0.918	0.048	0.060
Model 5	1583.54*	586	0.918	0.048	0.060
Primary Language Spoken at Home (English or Spanish)					
Model 1	1415.49*	538	0.925	0.046	0.059
Model 2	1446.64*	557	0.924	0.047	0.058
Model 3	1453.72*	562	0.924	0.048	0.058
Model 4	1502.45*	581	0.922	0.048	0.058
Model 5	1515.26*	586	0.921	0.048	0.058
Respondent's Relation to the Student (father/stepfather and mother/stepmother)					
Model 1	1555.92*	538	0.917	0.048	0.064
Model 2	1578.70*	557	0.917	0.049	0.063
Model 3	1589.47*	562	0.916	0.050	0.063
Model 4	1642.69*	581	0.913	0.050	0.063
Model 5	1656.73*	586	0.913	0.050	0.063

*p < .001.

Correlations among Factors

Correlations among scores on each of the subscales were computed to examine the relative independence of the scores, as well as the extent to which each factor assessed the construct of school climate. For these analyses, and all other analyses that follow, we used manifest indicators of the factor (i.e., sum of raw scores of items on the derived subscales and total scale). As shown in Table V.6, for all respondents combined, correlation coefficients among subscales ranged in strength of value (i.e., absolute value) from .70 to .91.

Table V.6						
Correlational Coefficients between Subscale and Total Scale Scores for the Full Sample (*Spanish DSCS−H*)						
	1	2	3	4	5	6
1. Teacher–Student Relations						
2. Student–Student Relations	.75*					
3. Clarity of Expectations	.87*	.72*				
4. Fairness of Rules	.90*	.71*	.91*			
5. School Safety	.84*	.75*	.82*	.82*		
6. Teacher Home Communication	.88*	.70*	.83*	.84*	.78*	
7. Total School Climate	.95*	.85*	.94*	.94*	.92*	.92*
Note. All correlations are significant at $p < .001$.						

Reliability

With respect to the reliability of Spanish DSCS−H scores, for all parents combined, internal consistency coefficients across the seven subscales ranged from .86 to .98. The reliability of scores for each of the seven subscales also was computed for each group with different gender, primary language spoken at home, and relation to the student. As shown in Table V.7, reliability coefficients ranged from .85 (Safety for female parents and Parent Satisfaction for fathers/stepfathers) to 1.00 (Teacher-Student Relations for parents with other relations to students and Safety for parents with other relations to students).

Table V.7								
Coefficients of Internal Consistency by Gender, Primary Language Spoken at Home, and Relations (*Spanish DSCS-H*)								
	Teacher-Student Relations	Student-Student Relations	Clarity	Fairness	Safety	Teacher-Home Commun-ication	Total School Climate	Parent Satisfaction*
Full Sample	.91	.92	.89	.90	.86	.89	.98	.89
Student's Gender								
Male	.91	.93	.88	.90	.87	.90	.98	.88
Female	.91	.92	.90	.90	.85	.89	.98	.89
Primary Language Spoken at Home								
English	.91	.93	.89	.91	.87	.90	.98	.89
Spanish	.91	.92	.89	.90	.86	.89	.98	.88
Respondent's Relation to Student								
Father/Stepfather	.87	.91	.85	.84	.82	.87	.97	.85
Mother/ Stepmother	.92	.93	.90	.91	.87	.90	.98	.89
Note. *Is not calculated into Total Score, as this is viewed as a separate scale.								

Means and Standard Deviations

Table V.8 presents the means and standard deviations for raw scores on the six subscales, and for the total scale score as a function of gender, primary language spoken at home, and respondent's relation to the student. Means and standard deviations also are presented for the Satisfaction Scale. Table V.9 presents means and standard deviations for grades 1-12.

A 2 (gender) X 2 (primary language spoken at home) X 2 (relation to student) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in the six subscale scores.

The results showed neither significant main effects nor interaction effects $p > .05$). Likewise, all effect sizes were very small.

Table V.8

Means and Standard Deviations as a Function of Student's Gender, Primary Language Spoken at Home, and Respondent's Relation to Student (*Spanish DSCS−H*)

		Teacher-Student Relations		Student-Student Relations		Clarity of Expectations		Fairness of Rules		School Safety		Teacher-Home Communication		Total School Climate		Parent Satisfaction*	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Student's Gender																	
Male	3.31	0.52	3.11	0.53	3.33	0.51	3.31	0.53	3.24	0.55	3.37	0.54	3.28	0.50	3.37	0.53	3.31
Female	3.29	0.51	3.11	0.53	3.31	0.49	3.29	0.50	3.24	0.51	3.35	0.50	3.26	0.46	3.38	0.52	3.29
Primary Language in Home																	
English	3.28	0.52	3.11	0.55	3.30	0.51	3.28	0.53	3.22	0.55	3.35	0.52	3.25	0.50	3.35	0.54	3.28
Spanish	3.31	0.51	3.12	0.52	3.33	0.50	3.31	0.50	3.26	0.51	3.37	0.52	3.28	0.47	3.39	0.51	3.31
Relation to Student																	
Father/ Stepfather	3.33	0.45	3.13	0.51	3.31	0.45	3.33	0.44	3.27	0.49	3.38	0.48	3.28	0.43	3.44	0.46	3.33
Mother/ Stepmother	3.29	0.53	3.11	0.53	3.32	0.51	3.29	0.53	3.23	0.54	3.35	0.53	3.26	0.49	3.36	0.54	3.29

Note. *Is not calculated into Total Score.

Table V.9

Means and Standard Deviations as a Function of Grade (*Spanish DSCS−H*)

		Teacher-Student Relations		Student-Student Relations		Clarity		Fairness		School Safety		Teacher-Home Communications		Total School Climate		Parent Satisfaction *	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
K	3.29	0.54	3.10	0.53	3.28	0.54	3.27	0.55	3.17	0.56	3.32	0.55	3.23	0.52	3.35	0.53	3.29
1	3.35	0.49	3.14	0.51	3.38	0.49	3.37	0.49	3.31	0.50	3.43	0.48	3.31	0.45	3.45	0.49	3.35
2	3.27	0.53	3.09	0.55	3.30	0.52	3.26	0.51	3.23	0.54	3.33	0.54	3.24	0.50	3.34	0.54	3.27
3	3.24	0.59	3.06	0.56	3.26	0.54	3.24	0.58	3.21	0.60	3.29	0.59	3.23	0.55	3.32	0.59	3.24
4	3.32	0.48	3.15	0.52	3.36	0.47	3.34	0.47	3.25	0.51	3.41	0.48	3.30	0.44	3.38	0.50	3.32
5	3.33	0.43	3.17	0.51	3.36	0.44	3.33	0.44	3.26	0.43	3.38	0.45	3.31	0.39	3.42	0.45	3.33

Note. *Is not calculated into Total Score.

Spanish Delaware Bullying Victimization Scale–Home (Spanish DBVS–H)

Initial results of confirmatory factor analyses conducted on the Spanish DBVS-H, using the same procedures used with the English version, showed that the same factor structure was not supported in the Spanish sample. Thus, exploratory confirmatory factor analyses were conducted to explore the factor structure. Based on those results, one item (II11. "A student threatened to harm my child") was deleted from further analyses due to poor factor loadings. Two sets of items were correlated (i.e., II9 with II10; II1 with II4). As a result of these preliminary analyses, the derived model consisted of three factors and included two sets of correlated items. Next, the proposed second-order factor model, as found for the English version, was compared with three alternative models: a one-factor model, a correlation model, and a bifactor model with a general factor and three specific factors.

The ICCs on the factor scores in full sample ranged from .02 (Verbal Bullying Victimization) to .04 (Social Bullying Victimization) and the total Bullying Victimization score in full sample was .03. Thus, group means were centered to produce ICCs of zero for each item.

Results of Confirmatory Factor Analyses

Comparing second-order model with alternative models. As shown in Table V.10, the proposed three-factor second-order model yielded adequate fit indices, whereas the one-factor model yielded poor fit statistics. The bifactor model failed to converge. When a three-factor correlation model was tested, each of the fit indices was the same as the three-factor second-order model because the model was just identified. As the total scores of bullying victimization based on the three subscale scores were used, the three-factor second-order model was selected as the final model.

Table V.10

Fit Statistics for Models Tested (DBVS-H-Spanish)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	117.504	52	0.922	0.049	0.052
Three-factor model	97.741	49	0.942	0.048	0.046
Second-order model	97.741	49	0.942	0.048	0.046

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s = 939. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses conducted on the second half of the sample, randomly-split, also generated robust fit statistics for the second-order model: χ^2 = 116.157 (39, *N* = 470), $p < .001$; CFI = .903, RMSEA = .065, and SRMR = .062. The completely standardized factor loadings were compared to ensure that there were no large differences across the randomly split samples. As illustrated in Table V.11, the indicators had generally similar factor loadings in the two samples. Because no appreciable differences in the fit indices or factor

loadings were found, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with the full sample and the subsamples is presented in Table V.12. As shown in Table V. 12, the model fit for student's gender and the primary language spoken at home was adequate; however, the model fit for respondent's relation to the student was poor. Thus, the measurement invariance was tested across only two subgroups (gender and primary language spoken at home).

Table V.11

Confirmatory Factor Analysis of the Second-order Model (DBVS-H-Spanish)

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: Bullying Victimization						
Verbal Bullying Victimization	1.01	0.04	26.43	0.99	0.03	34.41
Physical Bullying Victimization	0.93	0.05	20.11	0.89	0.07	12.48
Social Bullying Victimization	0.92	0.03	29.81	0.94	0.04	26.80
First-order Factor 1: Verbal Bullying Victimization						
1. My child was teased by someone saying hurtful things to him/her.	0.71	0.03	21.41	0.72	0.04	17.64
4. A student said mean things to my child.	0.73	0.04	16.65	0.81	0.04	20.69
7. My child was called names he or she didn't like.	0.70	0.08	8.51	0.65	0.07	9.67
10. Hurtful jokes were made up about my child.	0.76	0.07	10.61	0.72	0.05	14.59
First-order Factor 2: Physical Bullying Victimization						
2. My child was pushed or shoved on purpose.	0.81	0.04	22.33	0.76	0.05	16.90
5. My child was hit or kicked and it hurt.	0.78	0.06	14.16	0.78	0.05	15.04
8. A student stole or broke something of my child's on purpose.	0.60	0.10	6.17	0.51	0.12	4.26
First-order Factor 3: Social Bullying Victimization						
3. Students left my child out of things to make him/her feel badly.	0.82	0.04	20.10	0.74	0.09	8.50
6. A student told/got others not to like my child.	0.83	0.03	27.87	0.87	0.03	26.98
9. A student got others to say mean things about my child.	0.69	0.07	9.43	0.65	0.05	12.35

12. Students told another student not to be friends with my child because the other students didn't like my child.	0.80	0.04	22.38	0.70	0.03	23.11
Note. Loading = standardized factor loading; SE = standard error; z = robust z score.						

Table V.12

Fit Statistics Between Groups for Second-order Model (DSBV-H-Spanish)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	939	123.248	39	0.942	0.042	0.048
Male	455	101.09	39	0.901	0.058	0.059
Female	484	58.15	39	0.976	0.036	0.032
English Spoken at Home	444	76.08	39	0.949	0.046	0.046
Spanish Spoken at Home	496	87.69	39	0.930	0.051	0.050
Father/Stepfather	182	80.32	39	0.869	0.091	0.076
Mother/Stepmother	751	101.69	39	0.949	0.041	0.046

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. **p* <.001

Measurement invariance across students' gender. A model testing the configural invariance across male and female students yielded adequate fit statistics (see Table V.13). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) indicated invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 14.72 (Δdf = 8), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 2.97 (Δdf = 2), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loadings and intercepts of measured variables (Model 4) and invariance of first- and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 0.02 (Δdf = 8), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors across gender: Satorra–Bentler scaled chi-square difference test = 0.39 (Δdf = 2), p = ns, ΔCFI < .01.

Measurement invariance across primary language spoken at home being either English or Spanish. A model testing the configural invariance across English and Spanish as the primary

language spoken at home yielded fit adequate fit statistics (see Table V.15). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) indicated invariance of first-order factor loadings across the two groups: Satorra–Bentler scaled chi-square difference test = 24.43 ($\Delta df = 8$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 2.74 ($\Delta df = 2$), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of invariance of first- and second-order factor loadings and intercepts (Model 4) and invariance of first- and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 5.57 ($\Delta df = 8$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loadings and intercepts of measured variables (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = 2.15 ($\Delta df = 2$), p = ns, ΔCFI < .01.

Table V.13

Fit Statistics for Confirmatory Factor Analysis of Second-order Model Testing Measurement Invariance across Student's Gender and Primary Language Spoken at Home (Spanish DBVS-H)

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Student's Gender					
Model 1	160.42*	78	0.942	0.048	0.047
Model 2	174.31*	86	0.938	0.077	0.047
Model 3	175.90*	88	0.938	0.077	0.046
Model 4	191.82*	96	0.933	0.077	0.046
Model 5	195.80*	98	0.931	0.077	0.046
Primary Language Spoken at Home					
Model 1	162.69*	78	0.941	0.049	0.048
Model 2	188.84*	86	0.928	0.067	0.050
Model 3	191.21*	88	0.928	0.068	0.050
Model 4	208.49*	96	0.921	0.068	0.050
Model 5	212.83*	98	0.919	0.068	0.050

*p < .001.

Correlations among Factors

For all parents/guardians combined, verbal bullying correlated .68 with physical bullying and .79 with social/relational bullying. Physical bullying correlated .69 with social/relational bullying.

Reliability

As shown in Table V.14, for all parents/guardians at the elementary school level, internal consistency coefficients of scores on the total scale ranged from .86 to .94. The coefficients of scores for each of the three subscales also were computed for each subgroup (2 Gender groups x 2 Primary Language groups x 2 Relation groups). Coefficients ranged from .58 (Physical Bullying for fathers/stepfathers) to .94 (Verbal Bullying for those who reported English as the primary language spoken at home).

For scores on the Verbal and Social/Relational subscales and the Total Bullying Victimization Scale, there were negligible differences between the coefficients between parents/guardians of boys (.83 to .91) and girls (.83 to .93); between homes with English as the primary spoken language (.85 to .94) to homes with Spanish as the primary spoken language (.80 to .89); between father/stepfathers (.78 to .86) to mother/stepmother (.83 to .93). The reliability coefficients for the Physical Bullying Victimization subscale were generally lower than those for other subscales and the total scale, as shown in Table V.14. A primary reason is that the Physical Bullying subscale consists of only three items, whereas the other two subscales have four items.

Table V.14

Reliability Coefficients by Gender, Primary Language Spoken at Home, and Respondent's Relation to Student (Spanish DBVS-H)

	Verbal	Physical	Social/ Relational	Total
Full Sample	.86	.86	.83	.92
Student's Gender				
Male	.84	.76	.83	.91
Female	.87	.66	.83	.93
Primary Language Spoken at Home				
English	.89	.62	.85	.94
Spanish	.81	.75	.80	.89
Respondent's Relation to Student				
Father/Stepfather	.78	.58	.81	.86
Mother/Stepmother	.88	.72	.83	.93

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table V.15. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table V.16 shows those scores as a function of grades K-5.

A 2 (gender) X 2 (primary language spoken at home) X 2 (relation to student) multivariate analysis of variance (MANOVA), using Pillai criteria, was conducted to test differences between groups in the three subscale scores.

The results showed neither significant main effects nor interaction effects $p > .05$). Likewise, all effect sizes were very small.

Table V.15

Means and Standard Deviations for Subscale and Scale Scores by Gender, Most Spoken Language, and Relations (Spanish DBVS-H)

		Verbal		Physical		Social/ Relational		Total	
	n	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Student's Gender									
Male	455	1.31	0.63	1.23	0.47	1.22	0.55	1.25	0.50
Female	484	1.38	0.76	1.21	0.54	1.27	0.58	1.28	0.57
Primary Language Spoken at Home									
English	444	1.33	0.76	1.20	0.51	1.24	0.59	1.26	0.59
Spanish	496	1.36	0.65	1.24	0.50	1.25	0.54	1.27	0.49
Respondent's Relation to Student									
Father/Stepfather	182	1.31	0.60	1.20	0.46	1.21	0.51	1.24	0.45
Mother/Stepmother	751	1.36	0.72	1.23	0.52	1.25	0.58	1.28	0.56
Others	6	1.71	1.01	1.13	0.30	1.46	0.78	1.25	0.42

Table V.16

Means and Standard Deviations for Subscale and Scale Scores for Grades K-5 (Spanish DBVS-H)

		Verbal		Physical		Social/ Relational		Total	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
K	144	1.28	0.61	1.21	0.44	1.20	0.55	1.23	0.51
1	157	1.48	0.74	1.31	0.53	1.34	0.58	1.37	0.55
2	172	1.36	0.65	1.19	0.42	1.22	0.55	1.26	0.48
3	196	1.37	0.84	1.23	0.57	1.26	0.62	1.28	0.62
4	144	1.25	0.53	1.18	0.50	1.19	0.48	1.21	0.46
5	151	1.33	0.74	1.21	0.52	1.23	0.58	1.24	0.57

Delaware Spanish Student Engagement Scale-Home (Spanish DSES-H)

The ICCs on the total school engagement scores and subscale scores of the Spanish DSES-H for full sample were all zero. However, consistent with the procedure used with Spanish DSCS-H Spanish DSBV-H measures, individual item responses were centered on the school mean by utilizing the centering command in Mplus.

As conducted above for the Spanish DSES-H, a second-order model with one higher-order factor (total school engagement) and three lower-order factors (behavioral, cognitive, and emotional) was proposed. Alternative models, as noted below, also were tested.

Results of Confirmatory Factor Analyses

Comparing second-order model with alternative models. As shown in Table V.17, the proposed three-factor second-order model yielded adequate fit indices, whereas a one-factor model yielded poor fit statistics. The bifactor model failed to converge. When a three-factor model was tested, each of the fit indices was the same as for the second-order model because the model was just identified. As the total scores of school engagement based on the three subscale scores were used, the second-order model was selected as the final model.

Table V.17

Fit Statistics for Models Tested (Spanish DSES-H)

Model	χ^2	*df*	CFI	SRMR	RMSEA
One-factor model	152.498	54	0.957	0.033	0.062
Three-factor model	79.811	51	0.987	0.023	0.035
Second-order model	79.811	51	0.987	0.023	0.035

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation. *N*'s =939. Models were tested on approximately one half of sample, randomly selected.

*$p < .001$.

Confirming fit of final model. Confirmatory factor analyses on the second half of the sample, randomly-split, also generated robust fit statistics for the second-order model: $\chi^2 = 113.11$ (41, $N = 470$), $p < .001$; CFI = .967, RMSEA = .051, and SRMR = .033. The completely standardized factor loadings were compared to ensure that there were no large differences across the two randomly selected samples. As illustrated in Table V.18, the indicators had generally similar factor loadings. Because no appreciable differences in the fit indices or factor loadings were found, all subsequent analyses were run with the full sample. A summary of the fit statistics for the three-factor model with full sample and subsamples is presented in Table V.19.

Table V.18

Confirmatory Factor Analysis of the Second-order Model of the Spanish DSES-H

	Sample 1			Sample 2		
Item	Loading	SE	z	Loading	SE	z
Second-order Factor: School Engagement						
Behavioral Engagement	0.99	0.01	96.50	1.01	0.02	57.21
Cognitive Engagement	1.03	0.01	147.38	1.00	0.03	40.60
Emotional Engagement	0.90	0.03	35.02	0.84	0.03	28.77
First-order Factor 1: Behavioral Engagement						
1. My child pays attention in class.	0.79	0.03	29.44	0.75	0.02	33.89
4. My child follows the rules at school.	0.90	0.01	68.65	0.84	0.02	36.53
7. When my child doesn't do well, he/she works harder.	0.82	0.02	44.99	0.78	0.02	37.18
10. My child stays out of trouble at school.	0.76	0.03	22.66	0.64	0.04	16.04
First-order Factor 2: Cognitive Engagement						
2. My child tries his/her best in school.	0.88	0.02	53.33	0.83	0.02	43.42
5. My child turns in his/her homework on time.	0.77	0.04	20.71	0.69	0.03	21.34
8. My child gets good grades in school.	0.69	0.03	21.89	0.62	0.02	27.56
11. My child has plans for more school or training after high school.	0.78	0.03	28.01	0.73	0.04	19.77
First-order Factor 3: Emotional Engagement						
3. My child feels happy in school.	0.85	0.02	35.26	0.85	0.02	44.10
6. My child thinks that his/her school is a fun place to be.	0.81	0.03	25.31	0.79	0.03	30.87
9. My child likes students who go to this school	0.78	0.04	20.31	0.78	0.03	25.54
12. My child likes this school.	0.85	0.02	34.96	0.81	0.03	31.91

Note. Loading = standardized factor loading; SE = standard error; z = robust z score.

Table V.19

Fit Statistics Between Groups for Second-order Model (Spanish DSES-H)

Model	*N*	χ^2	*df*	CFI	SRMR	RMSEA
Full Sample	937	169.493	51	0.973	0.026	0.05
Male	454	87.48	51	0.982	0.027	0.040
Female	483	131.90	51	0.967	0.031	0.057
English Spoken at Home	443	124.43	51	0.914	0.048	0.089
Spanish Spoken at Home	494	161.16	51	0.969	0.028	0.054
Father/Stepfather	182	129.86	51	0.965	0.030	0.059
Mother/Stepmother	749	124.88	51	0.964	0.031	0.054

Note. χ^2 = Chi-square statistic; *df* = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean- Square Residual; RMSEA = Root Mean-Square Error of Approximation.
*p <.001

Measurement invariance across student's gender. A model testing the configural invariance across male and female students yielded adequate fit statistics (see Table V.20). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 12.01 (Δdf = 10), p = ns , ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) also indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 3.26 (Δdf = 2), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts of measured variables (Model 4) and invariance of first- and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 4.55 (Δdf = 8), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = 0.58 (Δdf = 3), p = ns, ΔCFI < .01.

Measurement invariance across primary language spoken at home being either English or Spanish. A model testing the configural invariance across English and Spanish as the primary language spoken at home yielded adequate fit statistics (see Table V.20). The difference between test statistics for the invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated invariance of first-order factor loadings across English and Spanish: Satorra–Bentler scaled chi-square difference test = 4.89 (Δdf = 10), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) also indicated

invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 0.44 ($\Delta df = 2$), p = ns, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loading and intercepts (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 26.35 ($\Delta df = 8$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loading and intercepts (Model 4) also indicated invariance of first-order latent factors across English and Spanish: Satorra–Bentler scaled chi-square difference test = 2.73 ($\Delta df = 3$), p = ns, ΔCFI < .01.

Measurement invariance across respondent's relation to student. A model testing the configural invariance across groups reporting being either the child's father/stepfather or mother/stepmother yielded adequate fit statistics (see Table V.20). The difference between test statistics for invariance of first-order factor loadings (Model 2) and configural invariance (Model 1) models indicated invariance of first-order factor loadings: Satorra–Bentler scaled chi-square difference test = 24.10 ($\Delta df = 10$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings (Model 3) and invariance of first-order factor loadings (Model 2) also indicated invariance of second-order factor loadings: Satorra–Bentler scaled chi-square difference test = 44.49 (Δdf =2), p < .001, ΔCFI < .01.

The difference between test statistics for the models testing invariance of first- and second-order factor loading and intercepts (Model 4) and invariance first- and second-order factor loadings (Model 3) indicated invariance of intercepts: Satorra–Bentler scaled chi-square difference test = 10.46 ($\Delta df = 8$), p = ns, ΔCFI < .01. The difference between test statistics for the models testing invariance of first- and second-order factor loadings and intercepts and first-order latent factors (Model 5) and invariance of first- and second-order factor loadings and intercepts (Model 4) indicated invariance of first-order latent factors: Satorra–Bentler scaled chi-square difference test = 0.68 ($\Delta df = 3$), p = ns, ΔCFI < .01.

Table IV. 20

Fit Statistics for Confirmatory Factor Analysis of Three-factor Model Testing Measurement Invariance across Gender, Primary Language Spoken at Home, and Respondent's Relation to Student

	χ^2	*df*	*CFI*	*SRMR*	*RMSEA*
Student's Gender					
Model 1	220.05	102	0.973	0.029	0.050
Model 2	237.18	112	0.972	0.031	0.049
Model 3	240.68	114	0.971	0.033	0.049
Model 4	257.41	122	0.969	0.033	0.049
Model 5	263.71	125	0.969	0.033	0.049
Primary Language Spoken at Home					
Model 1	255.33	102	0.965	0.031	0.057
Model 2	271.45	112	0.964	0.031	0.055
Model 3	272.77	114	0.964	0.032	0.055
Model 4	292.01	122	0.961	0.032	0.055
Model 5	299.16	125	0.960	0.032	0.055
Respondent's Relation to Student					
Model 1	282.73	102	0.959	0.032	0.062
Model 2	271.45	112	0.964	0.031	0.055
Model 3	307.26	114	0.956	0.035	0.060
Model 4	328.53	122	0.953	0.035	0.060
Model 5	336.52	125	0.952	0.035	0.060

Note. Model 1: Configural invariance. Model 2: Invariance of first-order factor loadings. Model 3: Invariance of first- and second-order factor loadings. Model 4: Invariance of first- and second-order factor loading and intercepts of measured variables. Model 5: Invariance of first- and second-order factor loadings and intercepts of measured variables and first-order latent factors. χ^2 = Chi-square statistic; df= degrees of freedom; CFI= Comparative Fit Index; SRMR= Standardized Root Mean- Square Residual; RMSEA= Root Mean-Square Error of Approximation.
*p <.001

Correlations among Factors

For all Spanish-speaking parents/guardians combined, behavioral engagement correlated .81 with cognitive engagement and .56 with emotional engagement. Cognitive engagement correlated .56 with emotional engagement. The total score correlated .90 with behavioral engagement, .87 with cognitive engagement, and .85 with emotional engagement.

Reliability

As shown in Table V.21, for all Spanish-speaking parents/guardians combined, internal consistency coefficients were .86 for Behavioral Engagement, .74 for Cognitive Engagement, .83 for Emotional Engagement, and .95 for Total Engagement. The reliability of scores for each of the subscales also was computed for each subgroup, with coefficients ranging from .62 to .88.

Table V. 21

Reliability Coefficients by Gender, Language, and Relations (Spanish DSES-H)

	Behavioral Engagement	Cognitive Engagement	Emotional Engagement	Total Engagement
Full Sample	.86	.74	.83	.95
Student's Gender				
Male	.87	.66	.83	.95
Female	.85	.80	.83	.95
Primary Language Spoken at Home				
English	.88	.81	.85	.95
Spanish	.84	.66	.80	.94
Respondent's Relation to Student				
Father/Stepfather	.84	.62	.81	.95
Mother/Stepmother	.87	.76	.83	.95

Means and Standard Deviations

Means and standard deviations for the student level scores across grade level, racial/ethnic, and gender groups are shown in Table V. 22. Scores are the average item scores for items on the respective subscale or scale (i.e., sum of scores on each subscale divided by the subscale's number of items). Table V.23 shows those scores as a function of grades K-5.

A 2 (gender) X 3 (relations) X 2 (most spoken language) multivariate analysis of variance MANOVA, using Pillai criteria, was conducted to test differences between groups in scores on the two subscales. No statistically significant overall main effects and interaction effects were found for gender, relations, and most spoken language.

Table V.22

Means and Standard Deviations for Subscale and Scale Scores by Gender, Primary Language Spoken at Home, and Respondent's Relation to Student (Spanish DSES-H)

		Behavioral Engagement		Cognitive Engagement		Emotional Engagement		Total	
	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Student's Gender									
Male	455	3.37	0.52	3.35	0.51	3.42	0.54	3.38	0.49
Female	484	3.39	0.53	3.40	0.53	3.41	0.53	3.41	0.49
Primary Language Spoken at Home									
English	444	3.38	0.55	3.38	0.54	3.42	0.55	3.41	0.51
Spanish	496	3.38	0.50	3.37	0.50	3.40	0.52	3.39	0.48
Respondent's Relation to Student									
Father/Stepfather	182	3.31	0.55	3.35	0.53	3.41	0.52	3.36	0.50
Mother/Stepmother	751	3.40	0.52	3.38	0.52	3.41	0.54	3.41	0.49

Table V.23

Means and Standard Deviations for Subscale and Scale Scores for Grades K-5 (Spanish DSES-H)

		Behavioral Engagement		Cognitive Engagement		Emotional Engagement		Total	
Grade	N	Mean	SD	Mean	SD	Mean	SD	Mean	SD
K	144	3.31	0.48	3.27	0.47	3.43	0.47	3.35	0.44
1	157	3.41	0.54	3.40	0.53	3.45	0.54	3.42	0.51
2	172	3.32	0.54	3.32	0.52	3.36	0.54	3.34	0.50
3	196	3.35	0.58	3.36	0.59	3.39	0.61	3.38	0.56
4	144	3.43	0.52	3.44	0.51	3.44	0.52	3.45	0.49
5	151	3.46	0.44	3.46	0.43	3.43	0.47	3.46	0.41

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Appendix A
Comparison of Delaware School Climate Surveys to Other School Climate Surveys

Survey	Grades	Surveyed Population			Validating Studies in Peer-Reviewed Journal	Measured Constructs								
		Student	Staff	Home		Teacher-Student Relationships	Student-Student Relationships	Home-School Communications	School Safety	Clarity of Expectations	Fairness of Rules	Respect for Diversity	Student Engagement	Bullying
Delaware School Climate Survey (2012 revision)	3-12	X	X	X	Yes (2007 version only)	X	X	X	X	X	X	X	X	X
School Climate Surveys listed in the School Climate Survey Compendium (http://safesupportiveschools.ed.gov/)														
Alaska School Climate and Connectedness Survey	5-12	X	X		No	X	X	X	X		X			
American Institutes for Research Conditions for Learning Survey	6-12	X			No	X	X		X		X			
California School Climate Surveys (including CA Healthy Kids Survey)	4-12	X	X	X	Yes (student only)	X		X	X		X	X		
The Center for Research in Educational Policy School Climate Inventory	All		X		No			X						
Communities That Care Youth Survey[1]	6-12	X			Yes									
The Consortium on Chicago School Research Survey of Chicago Public Schools	6-12	X	X		No	X	X	X	X				X	
Culture of Excellence & Ethics Assessment	3-12	X	X	X	No	X			X				X	
Effective School Battery	6-12	X	X		Yes	X			X	X	X	X		
National School Climate Center Comprehensive School Climate Inventory	3-12	X	X	X	No	X	X	X				X		X
Perceived School Experiences Scale	7-12	X			No								X	

Survey	Grades	Surveyed Population			Validating Studies in Peer-Reviewed Journal	Measured Constructs								
		Student	Staff	Home		Teacher-Student Relationships	Student-Student Relationships	Home-School Communications	School Safety	Clarity of Expectations	Fairness of Rules	Respect for Diversity	Student Engagement	Bullying
Pride Learning Environment Survey	**6-12**	**X**			**No**	**X**			**X**				**X**	**X**
Pride Teaching Environment Survey	**6-12**		**X**		**No**								**X**	
Search Institute Creating a Great Place to Learn Survey	**6-12**	**X**	**X**		**No**	**X**		**X**	**X**		**X**			
Secondary Classroom Climate Assessment Instrument	**6-12**	**X**	**X**		**No**		**X**							
Secondary School Climate Assessment Instrument	**6-12**	**X**	**X**	**X**	**No**		**X**							
School Climate Surveys not listed above, but which have been published in peer-reviewed journals.														
Inventory of School Climate-Student (Brand et al., 2003)	**6-8**	**X**			**Yes**	**X**	**X**		**X**	**X**		**X**	**X**	**X**
Inventory of School Climate-Teacher (Brand et al., 2003)	**6-8**		**X**		**Yes**	**X**	**X**		**X**			**X**	**X**	
School Climate Surveys (Haynes et al., 2001)	**3-12**	**X**	**X**	**X**	**Yes (see proposal text, however)**	**X**	**X**		**X**	**X**	**X**			
School Climate Survey (Zullig et al., 2010)	**6-12**	**X**			**Yes**	**X**	**X**		**X**	**X**	**X**			
School Culture Scale (Higgins-D'Alessandro & Sad, 1997)	**9-12**	**X**			**Yes**	**X**	**X**							
Charles Kettering School Climate Profile	**6-12**	**X**			**Yes**	**X**	**X**							
School Climate Profiles (Griffith, 1999, 2000)	**3-6**	**X**		**X**	**Yes**	**X**			**X**					
School Environment Scale (Griffith, 2000)	**All**			**X**	**Yes**	**X**		**X**						

[1]Instrument includes 8 subscales but none align with those of the Delaware School Climate Survey.

Appendix B
Scales, Subscales, and Items on
Delaware School Survey–Student
2016 Version

Subscale	Student Version Items
Part I: School Climate Scale	
Teacher-Student Relations	2. Teachers treat students of all races with respect.
	7. Teachers care about their students.
	17. Teachers listen to students when they have problems.
	22. Adults who work here care about the students.
	26. Teachers like their students.
Student-Student Relations	11. Students are friendly with each other.
	16. Students care about each other.
	21. Students respect others who are different.
	30. Students treat each other with respect.
	31. Students get along with each other.
Student Engagement School-wide[2]	1. Most students turn in their homework on time.
	6. Most students try their best.
	23. Most students follow the rules.
	25. Most students like this school.
	29. Most students work hard to get good grades.
	12. Most students feel happy.
Clarity of Expectations	5. Rules are made clear to students.
	10. Students know how they are expected to act.
	15. Students know what the rules are.
	20. It is clear how students are expected to act.
Fairness of Rules	3. The school rules are fair.
	8. The consequences of breaking rules are fair.
	18. The school's Code of Conduct is fair.
	28. Classroom rules are fair.
School Safety	4. Students are safe in the hallways.
	13. Students feel safe.
	19. Students know they are safe in this school.
Bullying School-wide	9. Students threaten and bully others.
	14. Students worry about others bullying them.
	24. Bullying is a big problem in this school.
	27. Students bully one another.
Items Not Scored	32. I am telling the truth in this survey.

Part II: Positive, Punitive, and SEL Techniques Scale	
Use of Positive Behavioral Techniques	2. Students are praised often.
	5. Students are often given rewards for being good.
	8. Teachers often let students know when they are being good.
	11. Classes get rewards for good behavior.
	14. Teachers use just enough praise and rewards; not too much or too little.
Use of Punitive Techniques	1. Students are punished a lot.
	4. Students are often sent out of class for breaking rules.
	7. Students are often yelled at by adults.
	10. Many students are sent to the office for breaking rules.
	13. Students are punished too much for minor things.
Use of SEL Techniques	3. Students are taught to feel responsible for how they act.
	6. Students are taught to understand how others think and feel.
	9. Students are taught that they can control their own behavior.
	12. Students are taught how to solve conflicts with others.
	15. Students are taught they should care about how others feel.
	16. Students are often asked to help decide what is best for the class or school.
Part III: Student SEL Scale	
Responsible Decision-making/Responsibility	1. I blame others when I'm in trouble.
	5. I feel responsible for how I act.
	9. I am good at deciding right from wrong.
Understanding how others thing and feel/Social Awareness	2. I think about how others feel.
	6. I care about how others feel.
	10. What others think is important to me.
Self-management of emotions and behavior	3. I can control how I behave.
	7. I think before I act.
	11. I am good at waiting for what I want.
Relationship skills	4. I am good at solving conflicts with others.
	8. I get along well with others.
	12. I have one or more close friends.

Part IV: Bullying Scale	
Verbal Bullying	1. I was teased by someone saying hurtful things to me.
	4. A student said mean things to me.
	7. I was called names I didn't like.
	10. Hurtful jokes were made up about me.
Physical Bullying	2. I was pushed or shoved on purpose.
	5. I was hit or kicked and it hurt.
	8. A student stole or broke something of mine on purpose
	11. A student threatened to harm me.
Social/Relational Bullying	3. Students left me out of things to make me feel badly.
	6. A student told/got others not to like me.
	9. A student got others to say mean things about me.
	12. Students told another student not to be friends with me because the other students didn't like me.
Cyberbullying (Grades 6-12)	14. A student *sent me* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging.
	15. A student *sent to others* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging
	16. A student *posted* something mean or hurtful about me on a social media website such as Facebook, Twitter, or Instagram.
	17. A student *pretending to be me* sent or posted something hurtful or mean *about me or others* using text messaging, a social media website, email, or a similar method.
Items Not Scored	13. I was bullied in this school
Part V: Student Engagement Scale	
Behavioral Engagement	1. I pay attention in class.
	4. I follow the rules at school.
	7. When I don't do well, I work harder.
	10. I stay out of trouble at school.
Cognitive Engagement	2. I try my best in school.
	5. I turn in my homework on time.
	8. I get good grades in school.
	11. I have plans for more school or training after high school.
Emotional Engagement	3. I feel happy in school.
	6. My school is a fun place to be.
	9. I like students who go to this school.
	12. I like this school.
Item Not Scored	13. I answered all items truthfully on this survey.

Appendix C
Delaware School Climate Survey-Student
Grades 3-5
2016 Version

1. School Name: _____

2. Mark which gender you are:
__Boy __Girl

3. Mark your race:

__ American Indian or Alaskan Native __Asian __Black __ Hawaiian
__Hispanic/Latino __Multiracial __White

4. Mark your grade:
__ 3 __ 4 __ 5

5. Room # you are in now: _____

This survey is about how you feel about your school this year. Please choose one answer that best shows how you feel about each item. Do NOT give your name. No one will know who answered this survey. Please answer every item.

PART I: School Climate Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Most students turn in their homework on time.				
2. Teachers treat students of all races with respect.				
3. The school rules are fair.				
4. Students are safe in the hallways.				
5. Rules are made clear to students.				
6. Most students try their best.				
7. Teachers care about their students.				
8. The consequences of breaking rules are fair.				
9. Students threaten and bully others.				
10. Students know how they are expected to act.				

11. Students are friendly with each other.				
IN THIS SCHOOL…	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
12. Most students feel happy.				
13. Students feel safe.				
14. Students worry about others bullying them.				
15. Students know what the rules are.				
16. Students care about each other.				
17. Teachers listen to students when they have problems.				
18. The school's Code of Conduct is fair.				
19. Students know they are safe in this school.				
20. It is clear how students are expected to act.				
21. Students respect others who are different.				
22. Adults who work here care about the students.				
23. Most students follow the rules.				
IN THIS SCHOOL …..				
24. Bullying is a big problem in this school.				
25. Most students like this school.				
26. Teachers like their students.				
27. Students bully one another.				
28. Classroom rules are fair.				
29. Most students work hard to get good grades.				
30. Students treat each other with respect.				
31. Students get along with each other.				
32. I am telling the truth in this survey.				

PART II: Techniques Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Students are punished a lot.				
2. Students are praised often.				
3. Students are taught to feel responsible for how they act.				
4. Students are often sent out of class for breaking rules.				
5. Students are often given rewards for being good.				
6. Students are taught to understand how others think and feel.				
7. Students are often yelled at by adults.				
IN THIS SCHOOL …..				
8. Teachers often let students know when they are being good.				
9. Students are taught that they can control their own behavior.				
10. Many students are sent to the office for breaking rules.				
11. Classes get rewards for good behavior.				
12. Students are taught how to solve conflicts with others.				
13. Students are punished too much for minor things.				
14. Teachers use just enough praise and rewards; not too much or too little.				
IN THIS SCHOOL …..				
15. Students are taught they should care about how others feel.				
16. Students are often asked to help decide what is best for the class or school.				

Part III. Student SEL Scale **Please read each statement and mark the response that best shows how much it is like you.**	**Not like me at all**	**Not much like me**	**Some-what like me**	**Very much like me**
1. I blame others when I'm in trouble.				
2. I think about how others feel.				
3. I can control how I behave.				
4. I am good at solving conflicts with others.				
5. I feel responsible for how I act.				
6. I care about how others feel.				
7. I think before I act.				
8. I get along well with others.				
9. I am good at deciding right from wrong.				
10. What others think is important to me.				
11. I am good at waiting for what I want.				
12. I have one or more close friends.				
13. I answered all items truthfully on this survey.				

PART IV. Student Engagement Scale **Please read each statement and mark the response that best shows how much you agree.**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. I pay attention in class.				
2. I try my best in school.				
3. I feel happy in school.				
4. I follow the rules at school.				
5. I turn in my homework on time.				
6. My school is a fun place to be.				
7. When I don't do well, I work harder.				
8. I get good grades in school.				
9. I like students who go to this school.				
10. I stay out of trouble at school.				
11. I have plans for more school or training after high school.				
12. I like this school.				

Thank you for taking time to complete this survey.

Appendix D
Delaware School Survey−Student
Grades 6-12
2016 Version

1. School Name: _____

2. Mark which gender you are:
__Boy __Girl

3. Mark your race:

__ American Indian or Alaskan Native __Asian __Black __ Hawaiian
__Hispanic/Latino __Multiracial __White

4. Mark your grade:
__ 6 __ 7 __ 8 __ 9 __ 10 __ 11 __ 12

5. Room # you are in now: _____

This survey is about how you feel about your school this year. Please choose one answer that best shows how you feel about each item. Do NOT give your name. No one will know who answered this survey. Please answer every item.

PART I: School Climate Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Most students turn in their homework on time.				
2. Teachers treat students of all races with respect.				
3. The school rules are fair.				
4. Students are safe in the hallways.				
5. Rules are made clear to students.				
6. Most students try their best.				
7. Teachers care about their students.				
8. The consequences of breaking rules are fair.				
9. Students threaten and bully others.				
10. Students know how they are expected to act.				

11. Students are friendly with each other.				
IN THIS SCHOOL …..	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
12. Most students feel happy.				
13. Students feel safe.				
14. Students worry about others bullying them.				
15. Students know what the rules are.				
16. Students care about each other.				
17. Teachers listen to students when they have problems.				
18. The school's Code of Conduct is fair.				
19. Students know they are safe in this school.				
20. It is clear how students are expected to act.				
21. Students respect others who are different.				
22. Adults who work here care about the students.				
23. Most students follow the rules.				
IN THIS SCHOOL …..				
24. Bullying is a big problem in this school.				
25. Most students like this school.				
26. Teachers like their students.				
27. Students bully one another.				
28. Classroom rules are fair.				
29. Most students work hard to get good grades.				
30. Students treat each other with respect.				
31. Students get along with each other.				
32. I am telling the truth in this survey.				

PART II: Techniques Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Students are punished a lot.				
2. Students are praised often.				
3. Students are taught to feel responsible for how they act.				
4. Students are often sent out of class for breaking rules.				
5. Students are often given rewards for being good.				
6. Students are taught to understand how others think and feel.				
7. Students are often yelled at by adults.				
IN THIS SCHOOL …..				
8. Teachers often let students know when they are being good.				
9. Students are taught that they can control their own behavior.				
10. Many students are sent to the office for breaking rules.				
11. Classes get rewards for good behavior.				
12. Students are taught how to solve conflicts with others.				
13. Students are punished too much for minor things.				
14. Teachers use just enough praise and rewards; not too much or too little.				
IN THIS SCHOOL …..				
15. Students are taught they should care about how others feel.				
16. Students are often asked to help decide what is best for the class or school.				

Part III. Student SEL Scale **Please read each statement and mark the response that best shows how much it is like you.**	**Not like me at all**	**Not much like me**	**Somewhat like me**	**Very much like me**
1. I blame others when I'm in trouble.				
2. I think about how others feel.				
3. I can control how I behave.				
4. I am good at solving conflicts with others.				
5. I feel responsible for how I act.				
6. I care about how others feel.				
7. I think before I act.				
8. I get along well with others.				
9. I am good at deciding right from wrong.				
10. What others think is important to me.				
11. I am good at waiting for what I want.				
12. I have one or more close friends.				

PART IV. Bullying Scale **Since September, how often has the following been done to you by another student(s) at this school? Please mark the response that best describes how often.**	**Never**	**Less Than Once a Month**	**Once or Twice a Month**	**Once a Week**	**Several Times a Week**	**Every Day**
1. I was teased by someone saying hurtful things to me.						
2. I was pushed or shoved on purpose.						
3. Students left me out of things to make me feel badly.						

4. A student said mean things to me.						
5. I was hit or kicked and it hurt.						
6. A student told/got others not to like me.						
7. I was called names I didn't like.						
8. A student stole or broke something of mine on purpose.						
9. A student got others to say mean things about me.						
10. Hurtful jokes were made up about me.						
11. A student threatened to harm me.						
12. Students told another student not to be friends with me because the other students didn't like me.						
13. I was bullied in this school.						
Please mark the response that best shows how often another student(s) did this either in or out of school.	**Never**	**Less Than Once a Month**	**Once or Twice a Month**	**Once a Week**	**Several Times a Week**	**Every Day**
14. A student *sent me* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging.						
15. A student *sent to others* a mean or hurtful message about me using email, text messaging, instant messaging, or similar electronic messaging.						
16. A student *posted* something mean or hurtful about me on a social media website, such as Facebook, Twitter, or Instagram.						
17. A student *pretending to be me* sent or posted something hurtful or mean *about me or others* using text messaging, a social media website, email, or a similar method.						

PART V. Student Engagement Scale **Please read each statement and mark the response that best shows how much you agree.**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. I pay attention in class.				
2. I try my best in school.				
3. I feel happy in school.				
4. I follow the rules at school.				
5. I turn in my homework on time.				
6. My school is a fun place to be.				
7. When I don't do well, I work harder.				
8. I get good grades in school.				
9. I like students who go to this school.				
10. I stay out of trouble at school.				
11. I have plans for more school or training after high school.				
12. I like this school.				
13. I answered all items truthfully on this survey.				

Thank you for taking time to complete this survey.

Appendix E

Scales, Subscales, and Items on Delaware School Survey–Teacher/Staff 2015-16 Version

Subscale	Teacher/Staff Version Item
Part I: School Climate Scale	
Teacher-Student Relations	2. Teachers treat students of all races with respect.
	7. Teachers care about their students.
	17. Teachers listen to students when they have problems.
	22. Adults who work here care about the students.
	26. Teachers like their students.
Student-Student Relations	11. Students are friendly with each other.
	16. Students care about each other.
	21. Students respect others who are different.
	30. Students treat each other with respect.
	31. Students get along with each other.
Student Engagement School-wide	1. Most students turn in their homework on time.
	6. Most students try their best.
	23. Most students follow the rules.
	25. Most students like this school.
	29. Most students work hard to get good grades.
	12. Most students feel happy.
Clarity of Expectations	5. Rules are made clear to students.
	10. Students know how they are expected to act.
	15. Students know what the rules are.
	20. It is clear how students are expected to act.
Fairness of Rules	3. The school rules are fair.
	8. The consequences of breaking rules are fair.
	18. The school's Code of Conduct is fair.
	28. Classroom rules are fair.
School Safety	4. Students are safe in the hallways.
	13. Students feel safe.
	19. Students know they are safe in this school.
Bullying School-wide	9. Students threaten and bully others.
	14. Students worry about others bullying them.
	24. Bullying is a big problem in this school.
	27. Students bully one another.

Teacher-Home Communications	32. Teachers work closely with parents to help students when they have problems.
	34. Teachers do a good job communicating with parents.
	36. Teachers show respect toward parents.
	38. Teachers listen to the concerns of parents.
Staff Relations	33. Teachers, staff, and administrators function as a good team.
	35. There is good communication among teachers, staff, and administrators.
	37. Teachers, staff, and administrators work well together.
	39. Administrators and teachers support one another.
Part II: Positive, Punitive, and SEL Techniques Scale[3]	
Use of Positive Behavioral Techniques	2. Students are praised often.
	5. Students are often given rewards for being good.
	8. Teachers often let students know when they are being good.
	11. Classes get rewards for good behavior.
	14. Teachers use just enough praise and rewards; not too much or too little.
Use of Punitive Techniques	1. Students are punished a lot.
	4. Students are often sent out of class for breaking rules.
	7. Students are often yelled at by adults.
	10. Many students are sent to the office for breaking rules.
	13. Students are punished too much for minor things.
Use of SEL Techniques	3. Students are taught to feel responsible for how they act.
	6. Students are taught to understand how others think and feel.
	9. Students are taught that they can control their own behavior.
	12. Students are taught how to solve conflicts with others.
	15. Students are taught they should care about how others feel.
	16. Students are often asked to help decide what is best for the class or school.
Item Not Scored	40. I like this school.

Appendix F
Delaware School Climate Survey 2015-2016
Teacher and Staff Version

1. School Name/Code: _____

2. Position:
____ Classroom teacher (general or special education, including music, art, PE, etc.)

____ Administrator or Supervisor

___ Instructional or Pupil Support Professional Staff (e.g., school counselor, school psychologist, school nurse, librarian, educational diagnostician, consulting special education teacher)

___ Other (including paraprofessionals)

3. Grade(s) taught this year.
Please select the grade you teach or support; Select only one. If you teach more than one grade, please select the "multiple grades" option.

___ Preschool __ K __1 __ 2 __ 3 __ 4 __ 5 __ 6 __ 7 __ 8 __ 9 __ 10 __ 11 __ 12
__Multiple Grades

*4. Select your gender:
____ Male ____ Female

*5. Select your race:

__ American Indian or Alaskan Native __Asian __Black __ Hawaiian
__Hispanic/Latino __Multiracial __White

*No data for gender and race will be reported at the building level; only analyzed statewide. Thus, no respondent can be identified.

This survey reflects how you feel about your school this year. Please complete all items. To make sure that results are confidential, please do not write your name. Your scores will be added by a computer with the scores of other staff members to see how all staff members, as a group, feel about the school.

Part I: School Climate Scale **Please read each statement and mark the response best shows how much you agree.** **IN THIS SCHOOL…….**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Most students turn in their homework on time.				
2. Teachers treat students of all races with respect.				
3. The school rules are fair.				
4. Students are safe in the hallways.				

IN THIS SCHOOL…….	Disagree A LOT	Disagree	Agree	Agree A LOT
5. Rules are made clear to students.				
6. Most students try their best.				
7. Teachers care about their students.				
8. The consequences of breaking rules are fair.				
9. Students threaten and bully others.				
10. Students know how they are expected to act.				
11. Students are friendly with each other.				
12. Most students feel happy.				
13. Students feel safe.				
14. Students worry about others bullying them.				
IN THIS SCHOOL…….				
15. Students know what the rules are.				
16. Students care about each other.				
17. Teachers listen to students when they have problems.				
18. The school's Code of Conduct is fair.				
19. Students know they are safe in this school.				
20. It is clear how students are expected to act.				
21. Students respect others who are different.				
22. Adults who work here care about the students.				
23. Most students follow the school rules.				
24. Bullying is a big problem in this school.				
25. Most students like this school.				
26. Teachers like their students.				
27. Students bully one another.				

IN THIS SCHOOL…….	Disagree A LOT	Disagree	Agree	Agree A LOT
28. Classroom rules are fair.				
29. Most students work hard to get good grades.				
30. Students treat each other with respect.				
31. Students get along with each other.				
32. Teachers work closely with parents to help students when they have problems.				
33. Teachers, staff, and administrators function as a good team.				
34. Teachers do a good job communicating with parents.				
35. There is good communication among teachers, staff, and administrators.				
36. Teachers show respect toward parents.				
37. Teachers, staff, and administrators work well together.				
38. Teachers listen to the concerns of parents.				
39. Administrators and teachers support one another.				
40. I like this school.				

PART II: Techniques Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Students are punished a lot.				
2. Students are praised often.				
3. Students are taught to feel responsible for how they act.				
4. Students are often sent out of class for breaking rules.				
5. Students are often given rewards for being good.				
6. Students are taught to understand how others think and feel.				
7. Students are often yelled at by adults.				
IN THIS SCHOOL…….				
8. Teachers often let students know when they are being good.				
9. Students are taught that they can control their own behavior.				
10. Many students are sent to the office for breaking rules.				
11. Classes get rewards for good behavior.				
12. Students are taught how to solve conflicts with others.				
13. Students are punished too much for minor things.				
14. Teachers use just enough praise and rewards; not too much or too little.				
15. Students are taught they should care about how others feel.				
16. Students are often asked to help decide what is best for the class or school.				

Thank you for taking time to complete this survey.

Appendix G

Scales, Subscales, and Items on Delaware School Survey–Home 2016 Version

Subscale	Home Version Item
Part I: School Climate Scale	
Teacher-Student Relations	2. Teachers treat students of all races with respect.
	7. Teachers care about their students.
	17. Teachers listen to students when they have problems.
	22. Adults who work there care about the students.
	27. Teachers like their students.
Student-Student Relations	11. Students are friendly with each other.
	12. Students get along with each other.
	16. Students care about each other.
	21. Students respect others who are different.
	26. Students treat each other with respect.
Clarity of Expectations	5. Rules are made clear to students.
	10. Students know how they are expected to act.
	15. Students know what the rules are.
	20. It is clear how students are expected to act.
Fairness of Rules	3. The school rules are fair.
	8. The consequences of breaking rules are fair.
	18. The school's Code of Conduct is fair.
	28. Classroom rules are fair.
School Safety	4. Students are safe in hallways.
	13. Students feel safe.
	19. Students know they are safe.
Teacher-Home Communications	1. Teachers listen to the concerns of parents.
	23. Teachers show respect toward parents.
	24. Teachers work closely with parents to help students when they have problems.
	25. Teachers do a good job communicating with parents.
Satisfaction with School (not calculated in Total School Climate score)	6. Overall, the climate is positive.
	9. I am satisfied with the education students get.
	14. I am pleased with school discipline.
	29. I like this school.
Part II: Bullying Scale	
Verbal Bullying	1. My child was teased by someone saying hurtful things to him/her.
	4. A student said mean things to my child.
	7. My child was called names he/she didn't like.

	10. Hurtful jokes were made up about my child.
Physical Bullying	2. My child was pushed or shoved on purpose.
	5. My child was hit or kicked and it hurt.
	8. A student stole or broke something of my child's on purpose.
	11. A student threatened to harm my child.
Social/Relational Bullying	3. Students left my child out of things to make him/her feel badly.
	6. A student told/got others not to like my child.
	9. A student got others to say mean things about my child.
	12. Students told another student not to be friends with my child because the other students didn't like my child.
Items Not Scored	13. My child was bullied in this school.
Part III: Student Engagement Scale[2]	
Behavioral Engagement	1. My child pays attention in class.
	4. My child follows the rules at school.
	7. When my child doesn't do well, he/she works harder.
	10. My child stays out of trouble at school.
Cognitive Engagement	2. My child tries his/her best in school.
	5. My child turns in his/her homework on time.
	8. My child gets good grades in school.
	11. My child has plans for more school or training after high school.
Emotional Engagement	3. My child feels happy in school.
	6. My child thinks that his/her school is a fun place to be.
	9. My child likes students who go to this school.
	12. My child likes this school.

Appendix H
Delaware School Survey-Home
2016 Version

1. School Name: _____

2. Please mark which one of the following best describes your relation to the child or student living in the home for which you are completing the survey:

__ I am the father or stepfather __ I am the grandfather __ I am the uncle

__ I am the mother or stepmother __ I am the grandmother __ I am the aunt

__ I am not related __ Other

3. Please mark the gender of the student:

____ Male ____ Female

4. Mark the student's race:

__ American Indian or Alaskan Native __Black __Hispanic/Latino __White
__Asian __ Hawaiian __Multiracial

5. Mark the student's grade:

___ Preschool __ K __1 __ 2 __ 3 __ 4 __ 5 __ 6 __ 7 __ 8 __ 9 __ 10 __ 11 __ 12

6. What was the first language spoken by the student?

__ English __Spanish __Creole __Other

7. What best describes the language spoken by family members in your home?

__English only __Spanish only __Creole only
__Spanish and English __Creole and English
__A language other than English, Spanish, and Creole __English and a language other than Spanish or Creole

8. What is the language most often spoken by the student?

__ English __Spanish __Creole __Other

IF YOU ANSWERED "ENGLISH" TO EACH OF THE THREE QUESTIONS ABOVE, PLEASE DO NOT COMPLETE ITEMS 9, 10, AND 11 BELOW. GO TO ITEM 12.

9. How would you describe the student's ability to speak the language most often spoken (Q8)?
__ Poor __ Fair __ Good __ Excellent

10. How would you describe the student's ability to speak English?

__ Poor __ Fair __ Good __ Excellent

11. Does the student *currently* receive lessons in school to learn to speak English, such as bilingual lessons, lessons for English Language Learners (ELL), or lessons for English as a Second Language (ESL)?

__Yes __No __I do not know

12. Most children with disabilities receive special education services. Children who receive special education services have an Individualized Education Program (IEP) that is signed each year by the child's parent or guardian. Does the student receive special education services and have an IEP?

__Yes __No __I do not know

If your answer is no, please skip #13 and #14 and proceed to Part I of the survey.

13. If the student has a disability and an IEP, please select the student's Primary Disability, as indicated on the student's IEP (if no disability or IEP, please skip this).

☐ Learning Disability
☐ Mild Intellectual Disability
☐ Moderate Intellectual Disability
☐ Severe Intellectual Disability
☐ Developmental Delay
☐ Blind/Visual Impairment
☐ Hearing Impairment
☐ Deaf & Blind
☐ Speech/Language
☐ Traumatic Brain Injury
☐ Autism
☐ Emotional Disturbance
☐ Orthopedic Impairment
☐ Other Health Impairment (e.g. ADHD)

14. If the student has a disability and an IEP, please select the extent to which the student is with other children without disabilities during the school day.

__The entire school day __Over half of the day __Less than half of the day __Seldom or never

This survey is about how you feel about the school that your child, or the student, attends this year. Please fill in the circle that best shows how you feel about each item. Respond to each item based on your own experiences with the school as well as those of your child or student. If you are not sure how to respond, please guess. Do NOT give your name. No one will know who answered this survey.

PART I: School Climate Scale **Please read each statement and mark the response that best shows how much you agree.** **IN THIS SCHOOL…….**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. Teachers listen to the concerns of parents.				
2. Teachers treat students of all races with respect.				
3. The school rules are fair.				
4. Students are safe in hallways.				
5. Rules are made clear to students.				
6. Overall, the climate is positive.				
7. Teachers care about their students.				
8. The consequences of breaking rules are fair.				
9. I am satisfied with the education students get.				
10. Students know how they are expected to act.				
IN THIS SCHOOL…….	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
11. Students are friendly with each other.				
12. Students get along with each other.				
13. Students feel safe.				
14. I am pleased with school discipline.				
15. Students know what the rules are.				
16. Students care about each other.				
17. Teachers listen to students when they have problems.				
18. The school's Code of Conduct is fair.				
19. Students know they are safe in this school.				

IN THIS SCHOOL…….				
20. It is clear how students are expected to act.				
21. Students respect others who are different.				
22. Adults who work there care about the students.				
23. Teachers show respect toward parents.				
24. Teachers work closely with parents to help students when they have problems.				
25. Teachers do a good job communicating with parents.				
26. Students treat each other with respect.				
27. Teachers like their students.				
28. Classroom rules are fair.				
29. I like this school.				

PART II. Bullying Scale **Since September, how often has the following been done to *your child*(or the student of the survey) by one or more other students at this school? Please mark the response that best describes how often.**	**Never**	**Less Than Once a Month**	**Once or Twice a Month**	**Once a Week**	**Several Times a Week**	**Every Day**
1. My child was teased by someone saying hurtful things to him/her.						
2. My child was pushed or shoved on purpose.						
3. Students left my child out of things to make him/her feel badly.						
4. A student said mean things to my child.						
5. My child was hit or kicked and it hurt.						
6. A student told/got others not to like my child.						
7. My child was called names he/she didn't like.						
8. A student stole or broke something of my child's on purpose.						
9. A student got others to say mean things about my child.						
10. Hurtful jokes were made up about my child.						
11. A student threatened to harm my child.						
12. Students told another student not to be friends with my child because the other students didn't like my child.						
13. My child was bullied in this school.						

PART III: Student Engagement Scale **Please read each statement and mark the response that best shows how much you agree.**	**Disagree A LOT**	**Disagree**	**Agree**	**Agree A LOT**
1. My child pays attention in class.				
2. My child tries his/her best in school.				
3. My child feels happy in school.				
4. My child follows the rules at school.				
5. My child turns in his/her homework on time.				
6. My child thinks that his/her school is a fun place to be.				
7. When my child doesn't do well, he/she works harder.				
8. My child gets good grades in school.				
9. My child likes students who go to this school.				
10. My child stays out of trouble at school.				
11. My child has plans for more school or training after high school.				
12. My child likes this school.				

Thank you for taking time to complete this survey.

Appendix H
Delaware School Survey-Home Spanish
2016 Version

Encuesta Sobre El Ambiente Escolar de Delaware – 2015-2016
Versión del Hogar

Por favor use solamente un lápiz #2
Sombree los círculos completamente como está este círculo ●

1. Nombre de la Escuela: _____

2. Por favor marque una de las siguientes opciones que mejor describa su relación con el niño/a o estudiante que vive en el hogar para el que está completando la encuesta:

__ Yo soy el padre o padrastro __ Yo soy el abuelo __ Yo soy el tío

__ Yo soy la madre o madrastra __ Yo soy la abuela __ Yo soy la tía

__ Yo no estoy relacionado __ Otro

3. Marque el sexo del/la estudiante:

____ Masculino ____ Femenino

4. Marque la raza del/ la estudiante:

__ Indígena –Americano/a o Nativo de Alaska __Negro/a __Hispano/Latino/a __Blanco/a
__Asiático/a __ Hawaiano/a __Multi-Racial

5. Marque el grado escolar del/la estudiante:

___ Preescolar __ K __1 __ 2 __ 3 __ 4 __ 5 __ 6 __ 7 __ 8 __ 9 __ 10 __ 11 __ 12

6. ¿Cuál fue el primer idioma que habló el/la estudiante?

__ Inglés __español __Creole __Otro

7. ¿Qué enunciado mejor describe el idioma hablado por los miembros de la familia de su hogar?

__ Sólo Inglés __ Sólo español __ Sólo creole
__Un Idioma que no es inglés, español o creole __Español e inglés
__Creole e inglés __ Inglés y un idioma que no es español o creole

8. ¿Cuál es el idioma que el/la estudiante habla más frecuentemente?
__Inglés __Español __Creole __Otro

SI RESPONDIÓ "INGLÉS" A CADA UNO DE LAS TRES PREGUNTAS ANTERIORES, POR FAVOR NO COMPLETE LAS NÚMERO 9, 10 y 11 QUE SIGUEN A CONTINUACIÓN Y PASAR A AL NÚMERO 12.

9. ¿Cómo describiría la habilidad del/la estudiante de hablar el idioma que más frecuentemente habla (pregunta 8)?
__ Pobre __ Justo __Bueno __ Excelente

10. ¿Cómo describiría usted la habilidad del/la estudiante de hablar el idioma inglés?
__ Pobre __ Justo __Bueno __ Excelente

11. ¿Está el/la estudiante recibiendo actualmente clases en la escuela para aprender a hablar inglés, tales como clases bilingües, clases para estudiantes de Inglés como Segundo Lengua (ELL por sus siglas en inglés), o lecciones de Inglés como Segundo Idioma (ESL por sus siglas en Inglés)?

__Si __No __ No lo sé

12. La mayoría de los estudiantes con discapacidades recibe servicios de educación especial. Los estudiantes que reciben servicios de educación especial tienen un Programa de la Educación Individualizada (*IEP* por sus siglas en inglés) que está firmado cada año por los/as padres/ madres del estudiante. ¿Recibe su hijo/a o estudiante servicios de educación especial y tiene un *IEP*?
__Sí __No __No lo sé

Si usted ha marcado no, por favor omita la #13 y #14 y proceda a la Parte I de la encuesta.

13. Si el/ la estudiante tiene una discapacidad y un *IEP*, por favor seleccione la categoría de Elegibilidad Primaria del/la estudiante, como se indica en el *IEP* (si no tiene ninguna discapacidad o *IEP*, por favor omita esta pregunta).

☐ Discapacidad del Aprendizaje
☐ Discapacidad Intelectual Leve
☐ Problemas Emocionales
☐ Sordera y Ceguera
☐ Discapacidad Intelectual Severa
☐ Impedimento Visual
☐ Impedimento Auditivo
☐ Discapacidad Intelectual Moderada
☐ Impedimento Ortopédico
☐ Trastornos del Habla y el Lenguaje
☐ Otros Impedimentos de Salud (P. ej. *ADHD*)
☐ Retraso en el Desarrollo
☐ Lesión cerebral traumática (*TBI*, por sus siglas en inglés)
☐ Autismo

14. Si el/la estudiante tiene una discapacidad y un *IEP*, por favor seleccione el tiempo durante el día escolar en que el/la estudiantes está con otros niños/as que no tienen discapacidades.

__El día escolar completo __Más de la mitad del día escolar __Menos de la mitad del día escolar
__Rara vez o Nunca

Esta parte de la encuesta es sobre lo que piensa usted de la escuela a la que su hijo/a o estudiante asiste este año. Por favor sombree el círculo que mejor indique lo que piensa de cada enunciado. Responda cada pregunta basándose en sus propias experiencias con la escuela así como las de su hijo/a o estudiante. Si no está seguro/a de cómo responder, por favor trate de acertar. No dé su nombre. Nadie sabrá quién completó esta encuesta.

Parte I: Escala de Ambiente Escolar **Por favor lea cada enunciado y marque la respuesta que mejor indique cuán de acuerdo está usted.** **EN ESTA ESCUELA …**	**Muy en desacuerdo**	**Desacuerdo**	**De Acuerdo**	**Muy de Acuerdo**
1. Los/as maestros/as escuchan las preocupaciones de los/as padres/madres.				
2. Los/as maestros/as tratan con respeto a los/as estudiantes de todas las razas.				
3. Las reglas de la escuela son justas.				
4. Los/as estudiantes están seguros en los pasillos.				
5. Las reglas están claras para todos los estudiantes.				
6. En general, el ambiente escolar es positivo.				
7. Los/as maestros/as se preocupan por sus estudiantes.				
8. Las consecuencias por no cumplir las reglas son justas.				
9. Estoy satisfecho/a con la educación que reciben los/las estudiantes.				
10. Los/a estudiantes saben cuál es la conducta que se espera de ellos/as.				
EN ESTA ESCUELA…	**Muy en desacuerdo**	**Desacuerdo**	**De Acuerdo**	**Muy de Acuerdo**
11. Los/as estudiantes son amistosos/as entre sí.				
12. Los/as estudiantes se llevan bien entre ellos/as.				
13. Los estudiantes se sienten seguros/as.				
14. Estoy satisfecho/a con la disciplina escolar.				
15. Los/as estudiantes saben cuáles son las reglas.				
16. Los/as estudiantes se cuidan entre sí.				

17. Los/as maestros/as escuchan a los estudiantes cuando estos/as tienen problemas.				
18. El Código de Conducta de la escuela es razonable.				
19. Los/as estudiantes saben que están seguros/as en la escuela.				
20. Está claro cuál es la conducta que se espera de los/as estudiantes.				
21. Los/as estudiantes respetan a aquellos que son diferentes.				
EN ESTA ESCUELA…	**Muy en desacuerdo**	**Desacuerdo**	**De Acuerdo**	**Muy de Acuerdo**
22. Los adultos que trabajan allá se preocupan por los/as estudiantes.				
23. Las/os maestras/os muestran respeto hacia los padres/madres.				
24. Los/as maestros/as trabajan en estrecha colaboración con los padres/madres para ayudar a los/as estudiantes cuando tienen problemas.				
25. Las/os maestras/os hacen un buen trabajo comunicándose con los padres y madres.				
26. Los/as estudiantes se tratan con respeto entre ellos/as.				
27. Los/as maestros/as gustan de sus estudiantes.				
28. Las reglas del salón de clase son justas.				
29. Me gusta esta escuela.				

PARTE II. Escala de *Bullying*/Acoso escolar **Desde septiembre, ¿Qué tan frecuente *otro/a(s) estudiante(s)* le ha hecho lo siguiente *a su hijo/a en esta escuela*? Por favor marque la respuesta que mejor describa la frecuencia.**	**Nunca**	**Menos de Una Vez al Mes**	**Una o Dos Veces al Mes**	**Una Vez a la Semana**	**Varias Veces a la Semana**	**Todos los Días**
1. Mi hijo/a fue objeto de burlas por alguien que le dijo cosas hirientes a él/ella.						
2. Mi hijo/a fue empujado a propósito.						
3. Los/as estudiantes excluyeron a mi hijo/a de actividades para hacerlo/la sentir mal.						
4. Un/a estudiante le dijo cosas desagradables a mi hijo/a.						
5. Mi hijo/a fue golpeado o pateado y le dolió.						
6. Un/a estudiante le dijo o hizo que otros no gusten de mi hijo/a.						
7. A mi hijo/a le llamaban por nombres que a él/ella no le gustaban.						
8. Un/a estudiante robó o rompió algo de mi hijo/a intencionalmente.						
9. Un/a estudiante hizo que otros/as digan cosas desagradables sobre hijo/a.						
10. Bromas hirientes fueron hechas sobre mi hijo/a.						
11. Un/a estudiante amenazó con hacerle daño a mi hijo/a.						
12. Los/as estudiantes le dijeron a otro u otra estudiante que no sea amigo/a de mi hijo/a porque a ellos/as no les gustaba mi hijo/a.						
13. Mi hijo/a fue *bullied* o acosado en esta escuela.						

PARTE III: Escala de Participación del Estudiante **Por favor lea cada frase y marque la respuesta que mejor indique cuánto está de acuerdo.**	**Muy en desacuerdo**	**Desacuerdo**	**De Acuerdo**	**Muy de Acuerdo**
1. Mi hijo/a presta atención cuando está en clase.				
2. Mi hijo/a trata lo mejor de sí en la escuela.				
3. Mi hijo/a se siente contento/a en la escuela.				
4. Mi hijo/a sigue las reglas en la escuela.				
5. Mi hijo/a entrega su tarea escolar a tiempo.				
6. Mi hijo/a piensa que su escuela es un lugar divertido para estar.				
7. Cuando mi hijo/a no hace un buen trabajo, trabaja más duro para mejorar.				
8. Mi hijo/a obtiene buenas calificaciones en la escuela.				
9. A mi hijo/a le gustan los/as estudiantes que vienen a esta escuela.				
10. Mi hijo/a no se mete en problemas en la escuela.				
11. Mi hijo/a tiene planes de seguir sus estudios o tener más entrenamiento después de la escuela secundaria.				
12. Mi hijo/a gusta de esta escuela.				

Gracias por disponer del tiempo para completar esta encuesta.