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Bullying Victimization and Student Engagement in Elementary, Middle, and High Schools: Moderating Role of School Climate

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Bullying is the most common form of school violence and is associated with a range of negative outcomes, including traumatic responses. This study used hierarchical linear modeling to examine the multilevel moderating effects of school climate and school level (i.e., elementary, middle, and high schools) on the association between bullying victimization and student engagement. Participants included 25,896 students in 4th to 12th grades from 114 schools. Results indicated that, after controlling for student and school demographic factors, positive school climate was associated with higher behavioral/cognitive and emotional engagement of students across all grades. This highlights the critical and fundamental role of positive school climate in bullying prevention and intervention, among students across all grade levels, including those with frequent bullying victimization experience. Results also showed that negative associations between student-level bullying victimization and engagement were intensified in more positive school climates. This finding suggests that, in comparison with students in schools with less positive school climates, the engagement of bullying victims in schools with a more positive school climate might be more negatively influenced by their victimization experience. Additionally, the relation between student-level bullying victimization and emotional engagement was significantly different across middle and high schools.

Impact and Implications
The strong association between school climate and student engagement in this study supports the conclusion that fostering a positive school climate will promote greater student engagement for all students, including victims of bullying.

Keywords: bullying victimization, school climate, student engagement, moderating effect, risk and resilience

Bullying involves an intentional, systematic, and recurrent action instigated by an individual or group of individuals who are attempting to inflict physical and/or psychological harm on another person or persons to gain power, prestige, or goods (Espelage & Swearer, 2003). It is the most common form of school violence on school campuses and is associated with a range of negative outcomes (e.g., Felix, Greif Green, & Sharkey, 2014). For example, victims of bullying are more likely to experience internalizing problems, including anxiety and depression (Reijntjes, Kamphuis, Prinzie, & Telch, 2010), and externalizing problems, including aggression and delinquency (Reijntjes et al., 2011). Being a victim of bullying is also a chronic stressor that often results in traumatic responses and has significant and long-lasting impacts (Carney, 2008). A recent retrospective study among college students showed that the emotional trauma of being bullied during childhood might surpass that of other traumatic experiences, such as child abuse or neighborhood violence (Espelage, Hong, & Mebane, 2016).

Although the negative impact of bullying victimization on students' psychosocial and behavioral outcomes has been well documented, research has been inconclusive regarding the association between bullying victimization and educational outcomes (Gardella, Fisher, & Teurbe-Tolon, 2017). Several researchers have reported that bullying victimization is associated with academic difficulties,

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such as low student engagement and academic achievement (Konold & Cornell, 2015; Nakamoto & Schwartz, 2010), whereas other researchers have reported no correlation between bullying victimization and educational outcomes (Woods & Wolke, 2004). A meta-analysis by Nakamoto and Schwartz (2010) revealed a small but significant negative association between bullying victimization and academic functioning, with the effect size depending on the methodological features of the studies and participant characteristics (Lipsey & Wilson, 2001). Diverse findings are also likely caused by the discrepant inclusion of factors, including protective factors, which may influence the association between bullying victimization and educational outcomes. To better understand the complexity of the association between bullying victimization and its educational impacts, we used a multilevel approach to test whether a school-related factor (i.e., school climate) and grade level (i.e., elementary, middle, and high school levels) moderate the association between bullying victimization and student engagement. We selected student engagement as the key outcome because it is an alterable factor critical for positive youth development (Furlong, Morrison, & Greif, 2003).

Theoretical Orientation

According to socioecological theory, bullying and student engagement are intertwined, promoted, and inhibited because of complex associations between individual and contextual factors (Espelage & Swearer, 2004). Existing literature has empirically validated the socioecological theory; the presence, nature, and severity of adjustment difficulties evidenced by victims of bullying vary depending on factors related to the characteristics and experiences of individual students and the classroom and school contexts.

To date, most of the existing research examining moderators has focused on individual-level factors, such as individuals' demographic characteristics and social-emotional functioning. For example, research has found that the strength and direction of bullying victimization's association with academic achievement and emotional well-being varies across genders (Hanish & Guerra, 2002; Hoglund, 2007). Furthermore, bullying victims' school satisfaction and sense of school safety varied depending on their racial/ethnic background (Spriggs, Iannotti, Nansel, & Haynie, 2007). Moreover, research has demonstrated that bullying victims are at increased risk for negative outcomes when they: have low self-esteem or perceive themselves as less socially competent (Grills & Ollendick, 2002; Kochenderfer-Ladd, 2003), tend to blame themselves for being bullied (Visconti, Sechler, & Kochenderfer-Ladd, 2013), and lack coping strategies (Kochenderfer-Ladd & Skinner, 2002).

Research examining moderators beyond the individual level is still emerging (Kremer, 2010; Nakamoto & Schwartz, 2011). At the interpersonal level, studies have shown that positive interpersonal relationships among students, teachers, peers, and parents promote student engagement and serve a critical function for students who have experienced bullying victimization (Fite, Cooley, Williford, Frazer, & DiPierro, 2014). At the classroom level, Kremer (2010) found that when bullying victims perceived conflictual relationships with teachers, they tended to experience greater internalizing distress. At the school level, research has indicated that school factors, such as school climate and school demographics, play important roles in promoting student engagement and preventing bullying (Cornell, Shukla, & Konold, 2016; Konold, 2016). Relatedly, empirical studies have consistently shown that positive school climate (characterized by high structure and support) is concurrently related to higher levels of student engagement in both affective and cognitive domains, and less teasing and bullying at both student and school levels (Konold & Cornell, 2015; Konold, Cornell, Shukla, & Huang, 2017). However, there is limited scientific understanding about how school level factors influence the association between bullying victimization and student engagement.

Student Engagement

Student engagement is defined as "the quality of a student's connection or involvement with the endeavor of schooling and hence with the people, activities, goals, values, and place that compose it" (Skinner, Kindermann, & Furrer, 2009, p. 494). A growing number of studies have recognized that student engagement functions as a proximal outcome that profoundly shapes a range of distal outcomes for students, such as academic achievement (Estell & Perdue, 2013; Furlong et al., 2003). Student engagement represents a multidimensional and malleable construct that is responsive to the interaction between individual and contextual factors (Fredricks, Blumenfeld, & Paris, 2004).

Researchers have come to the consensus that student engagement includes at least two components: behavioral and emotional engagement (Li, Doyle Lynch, Kalvin, Liu, & Lerner, 2011). Behavioral engagement refers to academic involvement and participation in the learning activities in the classroom. Emotional engagement refers to students' affective attitudes toward classmates, teachers, and school. Some scholars have suggested that cognitive engagement, which is defined as a strategic investment in learning, represents a third component or a distinct subcomponent of behavioral engagement (Fredricks et al., 2004; Hoglund, 2007). Because of methodological considerations in the current study, student engagement is measured as a two-dimensional construct including emotional and cognitive–behavioral engagement.

Study Purpose

Grounded in the socioecological theoretical framework, this study aimed to examine individual and school-level moderating effects in the association between bullying victimization and student engagement. Specifically, we examined the moderating effects of school climate and grade level. School climate represents a multilevel construct that reflects not only the individual student's personal perceptions but also the whole group of students' shared perceptions of the social and structural features of their schools. School climate shapes the quality of the interactions of all school members and reflects the norms, values, and goals that represent the broader educational and social missions of the school (Wang & Degol, 2016). We selected school climate as the key protective factor because it represents the school culture and how safe, supportive, and positive the school environment is (Cohen, McCabe, Michelli, & Pickeral, 2009). We also examined the grade-level differences (i.e., elementary, middle, and high) in the association between bullying victimization and student engagement. No prior studies have examined associations between bullying

victimization and student engagement across all three grade levels. Given that grade level is related to both school structure and developmental stages of students, we considered it a critical variable to include when examining the association between bullying victimization and student engagement.

In addition, previous studies have shown that the association between bullying victimization and student engagement varies depending on the specific types of engagement studied (Mehta, Cornell, Fan, & Gregory, 2013; Veiga & Caldeira, 2014). Thus, in the present study, student engagement was studied as two separate outcomes: emotional engagement and cognitive–behavioral engagement.

This study directly responds to recent calls for research to examine the more proximal school mechanisms and outcomes associated with bullying victimization and the function of school, as a socioecological influence, in protecting bullying victims from the harmful impacts of bullying victimization (Gardella et al., 2017). Several important demographic factors at the student (i.e., gender, race/ethnicity) and school level (i.e., school size, grade level, percentage of students receiving free or reduced-price meals [FRPM], and the racial/ethnic diversity index of student body of the school) were controlled in these analyses (Konold, 2016; Konold et al., 2017).

Method

Participants

The sample consisted of 25,896 students (4th to 12th grade) from 114 public schools in the state of Delaware in the United States. Descriptive statistics and statewide comparison data are presented in Table 1.

Procedures

Between February and April of 2014, all Delaware public schools were invited by the Delaware Positive Behavior Support Project (DE-PBS) and the Delaware Department of Education (DDOE) to voluntarily participate in the administration of the Delaware School Survey as part of their school-wide annual assessment. The DDOE and the Institutional Review Board of the researchers' universities approved all measures and procedures, which included passive consent by parents. A total of 114 schools among a possible 173 public schools participated. The DE–PBS project provided schools with instructions outlining how many students should be surveyed (i.e., 100% of students in Grade 3 and above in elementary school, 50% of students (randomly selected) in middle and high schools with more than 300 students, and 100% of students in schools serving 300 or fewer students) and suggested methods for randomly selecting students from each grade level to ensure a representative student sample. Teachers or other school staff administered the survey, with 14.2% of the students completing a paper version of the survey in their classrooms and 85.8% of the students completing an electronic version of the survey on Qualtrics in a school computer lab. Teachers and staff were provided with a script to read to students before completing the survey, which included the purpose and voluntary nature of the survey, and assured students of confidentiality (neither names nor identification numbers were used). Educators were also encouraged to read the directions and survey items to students with

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

	Student participants								
	Elementary		Middle		High		Total		
Student demographic factors	*n*	%	*n*	%	*n*	%	*n*	%	State wide
Full sample	9,659	100%	9,535	100%	6,702	100%	25,896	100.00%	134,493
Male	4,718	48.85%	4,738	49.69%	3,114	46.46%	12,570	48.54%	N/A
Female	4,941	51.15%	4,797	50.31%	3,588	53.54%	13,326	51.46%	N/A
White	4,538	46.98%	4,304	45.14%	2,919	43.55%	11,761	45.42%	51.6%
African American	2,216	22.94%	2,296	24.08%	1,856	27.69%	6,368	24.59%	33.3%
Hispanic/Latino	1,511	15.64%	1,343	14.08%	918	13.70%	3,772	14.57%	11.3%
Asian	350	3.62%	335	3.51%	235	3.51%	920	3.55%	3.5%
Other race/ethnicity	1,044	10.81%	1,257	13.18%	774	11.55%	3,075	11.87%	.3%

	School participants				
Student demographic factors	Elementary	Middle	High	Total	
Full school sample	71	26	17	114	172
White	42.72%	45.86%	45.54%	44.71%	N/A
African-American	31.03%	32.38%	36.55%	33.32%	N/A
Hispanic/Latino	19.28%	16.05%	13.62%	16.32%	N/A
Asian	3.67%	3.07%	2.69%	3.14%	N/A
Indian-American	.41%	.36%	.41%	.39%	N/A
Hawaiian	.07%	.06%	.07%	.07%	N/A
Other race/ethnicity	2.82%	2.22%	1.11%	2.05%	N/A
Students receiving FRPM	60.07%	55.47%	53.62%	56.39%	37.8%
School size	540	767	1106	804	N/A

Note. FRPM = free and reduced priced meals.

reading difficulties. Teachers and classrooms remained anonymous to protect teachers from identification. After completing the assessment, each school was provided a comprehensive report as a participation incentive.

Two validity items were used to screen out students who may have responded randomly, admitted to not responding truthfully, or do not (or cannot) read the items. These two items are "I am telling the truth in this survey" and "I answered all items truthfully on this survey." Students who fail to respond "Agree" or "Strongly Agree" to both items were not included in the state's survey, and thus not included in the current study. Schools' valid survey response rates[1] (i.e., the number of students included in the final sample divided by the number of eligible students) ranged from 15.66 to 98.82% (M = 62.32%, median = 73.03%, average number of respondents in each school = 229). Missing responses to individual survey items ranged from 0.1 to 1.2%. Missing responses to composite scores ranged from 1.2 to 4.4%.

Measures

As described below, students completed the Delaware Bullying Victimization Scale–Student, the Delaware Student Engagement Scale–Student, and a modified version of Delaware School Climate Survey–Student (Bear, Gaskins, Blank, & Chen, 2011; Bear et al., 2014). Results of reliability analysis and confirmatory factor analysis supported these scales' reliability and validity. Moreover, the configural, weak, and strong factorial invariance was also found across grade levels (4th and 5th grades in elementary, middle, and high school), gender, and racial-ethnic groups (i.e., Caucasian, African American, Hispanic/Latino, Asian, and Other race/ethnicity including multirace/ethnicity; Bear et al., 2014). Detailed information about the reliability and validity of these scales can be found in the technical manuals.

Bullying victimization. The Delaware Bullying Victimization Scale–Student (DBVS–S; Bear et al., 2014) consists of 12 items measured on a 6-point Likert scale that assessed individual students' perceptions of how often they have been victims of the given bullying behavior "since you have been at this school this school year (since September)." Items were adapted from the *Adolescent Peer Relations Instrument: Bully/Target* (Marsh et al., 2011; Parada, 2000). Results of confirmatory factor analyses (CFA) demonstrated that the DBVS–S is best represented by a three-factor second-order model consisting of a higher order factor of bullying victimization and three lower-order factors of physical, verbal, and relational bullying victimization (χ^2 = 3,186.54 [51, N = 26,488], $p < .001$; comparative fit index [CFI] = .956, root mean square error of approximation [RMSEA] = .030, standardized root mean square residual [SRMR] = .048). Because the three subscale scores were highly correlated, composite scores for bullying victimization were calculated based on the 12 items and no subscale scale scores were included in the study. Higher scores represent more frequent bullying victimization. In this study, Cronbach's α reliability coefficients were .95 for all students combined, .94 for elementary school students, .95 for middle school students, and .96 for high school students.

Student engagement. The Delaware School Engagement Scale—Student (DSES–S, Bear et al., 2014) is a 10-item scale measured with a 4-point Likert scale that assessed students' perceptions of being involved, committed, or invested in emotional and cognitive/behavioral aspects of schooling. Results of a confirmatory factor analysis demonstrated that the DSES–S is best represented by a two-factor correlated model with two specific factors of cognitive–behavioral engagement and emotional engagement (χ^2 = 1524.32 [26, N = 25,896], $p < .001$; CFI = .987, RMSEA = .047, and SRMR = .040). Composite scores were calculated based on the two subscales: emotional engagement (5 items) and cognitive–behavioral engagement (5 items). Higher scores reflect greater student engagement. In this study, Cronbach's α reliability coefficients for the emotional engagement and cognitive–behavioral engagement subscales, respectively, were: .87 and .85 for all students combined; .87 and .82 for elementary school students, .87 and .85 for middle school students, and .85 and .84 for high school students.

School climate. The modified version of the 2014 Delaware School Climate Survey-Student (DSCS-S; Bear et al., 2011, 2014) is a 22-item 4-point Likert scale assessing students' perceptions of school climate. Results of confirmatory factor analyses suggested that the modified version of DSCS-S was best supported by a second-order model consisting of a higher-order factor of school climate and six lower-order factors, including teacher-student relationships, student-student relationships, fairness of rules, clarity of expectations, school safety, and respect for diversity (χ^2 = 5445.50 [18, N = 25,896], $p < .001$; CFI = .953, RMSEA = .037, SRMR = .038). In the current study, the overall school climate score was used. Cronbach's α reliability coefficients for total school climate scale were: .94 for all students combined, .92 for middle school students, .93 for middle school students, and .92 for high school students.

Demographics. Students' demographic information (i.e., gender, race/ethnicity) was self-reported by students when they completed the Delaware School Survey (Bear et al., 2014). Schools' demographic information (i.e., school size, grade level, percentage of students receiving free or reduced-price meals [FRPM], and the racial/ethnic diversity index of student body of the school) was collected from the public database from the DDOE.

Statistical Analyses

Statistical analyses were conducted in two stages: (a) computation of student- and school-level variables and interaction terms based on student-reported survey data, and (b) multilevel analysis in HLM 7.0.

In the first stage, group-mean centering and school-level aggregation were used, respectively, to compute student-reported scale scores of bullying victimization (BV) and school climate (SC) into within-school (i.e., $BV_{student\ level}$ and $SC_{student\ level}$) and between-school components (i.e., $BV_{school\ level}$ and $SC_{school\ level}$) to reflect the variance of individual students' personal perception and their shared perceptions of bullying victimization and school climate by taking into consideration the cluster effects of schools. Considering that the intraclass correlation (ICC) of BV and SC are relatively high,

[1] Some large middle and high schools ($n > 300$) chose to invite 100% of their students to participate the survey, instead of randomly sampling 50% of their students. Thus, we estimated that the actual response rate (= the numbers of students responded to the survey/number of students invited to the survey) in many middle and high schools is about twice of the valid response rate reported above.

and the range of school size and the numbers of schools are large, using aggregated school means as school-level predictors are considered minimally biased (Lüdtke et al., 2008). Grand mean centering was also applied to the dependent variable of emotional engagement and cognitive–behavioral engagement. The purpose of grand-mean centering is to conduct a natural standardization on the coefficients of main and moderating effects so that the coefficient estimates for moderating effects could also serve as the "effect size" to measure the relative strengths of the magnitude of the main and moderation effects (Dong, Spybrook, & Kelcey, 2016). Following the aggregation and centering procedures, three sets of interaction terms (i.e., $BV_{student\ level} \times SC_{student\ level}$; $BV_{school\ level} \times SC_{school\ level}$; $BV_{school\ level} \times$ Grade_Level1 and $BV_{school\ level} \times$ Grade_Level2) were created for examining the multilevel moderating effects of school climate and grade levels.

In the second stage, multilevel analyses were conducted in HLM 7.0 to examine the multilevel moderation effects of school climate and grade levels in the association between bullying victimization and student engagement. Two sets of univariate hierarchical linear regression models were sequentially specified and estimated with emotional engagement and cognitive–behavioral engagement as separate outcomes. For each set of models, an unconditional model with one outcome variable and no predictors was first specified to estimate the intraclass correlation coefficient (ICC), which represents the proportion of variance in student engagement explained at both the student and school levels. Then, demographic factors for students and schools, $BV_{student\ level}$, $BV_{school\ level}$, $SC_{student\ level}$, $SC_{school\ level,}$ were added sequentially, with one set of predictors added in each step, to examine the concurrent main effects of demographic covariates, bullying victimization, and school climate on student engagement at both student and school levels. Examining the main effects of demographic factors, BV, and SC sequentially served as the foundation for examining the moderating effects of SC in the association between BV and student engagement, with the consideration of demographic factors of students and schools. To examine the multilevel moderating effects of school climate, $BV_{student\ level} \times SC_{student\ level}$ and $BV_{school\ level} \times SC_{school\ level}$ were added as predictors into the previous main effect model to examine the student-level and school-level moderating effects of school climate. $SC_{school\ level}$ was also added as predictor to the student-level regression slope between $BV_{student\ level}$ and student engagement to examine the cross-level moderating effect of $SC_{school\ level}$ in the association between $BV_{student\ level}$ and student engagement. To examine the moderating effects of grade levels, the interaction terms $BV_{school\ level} \times$ Grade_Level1 and $BV_{school\ level} \times$ Grade_Level2 were first added as a school-level predictor to the main effect model to examine the grade level difference of the association between $BV_{school\ level}$ and student engagement. Then, Grade_Level1 and Grade_Level2 were added as predictors to the student-level regression slope between $BV_{student\ level}$ and student engagement to examine the grade level differences in the association between $BV_{student\ level}$ and student engagement. The moderating effects of school climate and grade levels were estimated in two separate models. The standardized coefficients, *SE*, *t* ratio, and *p* value estimated in the final model were used to examine the magnitude and practical importance of the main and moderating effects. To properly reveal and interpret the significant moderating effects, visual presentations were created using Model Graph within HLM to represent the association between bullying victimization and student engagement at different levels of school climate (i.e., 25th percentile value and 75th percentile value) and different grade levels (i.e., middle and high school levels). When the models were estimated in HLM, listwise deletion was performed for missing data based on the variables included in the models. Listwise deletion was chosen as the default approach in HLM to handle missing data. Researchers have recommended that it is reasonable to use listwise deletion over maximum likelihood (ML) or multiple imputation if it still yields a large sample (Allison, 2014). Moreover, some researchers have argued that listwise deletion may actually be less biased than ML when data are missing on predictor variables in regression analysis (Allison, 2014).

Results

School Level Effects

The ICC values based on the unconditional models with emotional and cognitive–behavioral engagement as the outcomes, respectively, indicated that 18.01% of the variance in students' perceptions of emotional engagement could be explained by factors at the school level, whereas 10.68% of the variance in students' perceptions of cognitive–behavioral engagement could be explained by factors at the school level, leaving 81.99% (emotional engagement) and 89.32% (cognitive–behavioral engagement) accounted for at the student level. The two unconditional models also showed that significant variance in student engagement was explained by school groupings ($\chi^2(113) = 6263.02$, $p < .001$ for emotional engagement; $\chi^2(113) = 3716.85$, $p < .001$ for cognitive–behavioral engagement), supporting the use of multilevel analyses (Lee, Loeb, & Lubeck, 1998).

Main Effects of Demographics, Bullying Victimization, and School Climate

When the main effects of demographic factors of students and schools on student engagement were examined, gender, race/ethnicity, grade level, and the socioeconomic status of the school population were found to have significant influences on student engagement (Yang, Bear, & May, in press[2]). $BV_{student\ level}$ had significant and negative association with emotional engagement whereas it had significant and positive association with cognitive–behavioral engagement. At both student and school levels, school climate had significant association with emotional and cognitive–behavioral engagement and the magnitudes of the associations were stronger for emotional engagement than cognitive–behavioral engagement.

Moderating Effects of School Climate

As shown in Table 2, at the student level, $SC_{student\ level}$ had significant moderating effects in the association between $BV_{student\ level}$ and cognitive–behavioral engagement, but not with emotional engagement. However, when the significant moderating effects with cognitive–behavioral engagement were graphed, the

[2] This study reported the detailed results of the main effects of student and school demographic factors on student engagement. It was cited in the present study to save space and to avoid repeating information.

Table 2
Statistical Estimates of Multilevel Main Effects and Moderating Effects

Predictors	Standardized coefficients	
	Emotional engagement	Cognitive–behavioral engagement
Main effects of BV and school climate on student engagement		
$BV_{student\ level}$	−.05***	.00
$BV_{school\ level}$	−.01	.10*
$School\ Climate_{student\ level}$	.91***	.42***
$School\ Climate_{school\ level}$	1.09***	.45***
Moderating effects of school climate in the association between BV and student engagement		
$BV_{student\ level} \times School\ Climate_{student\ level}$	−.01	−.04***
$BV_{school\ level} \times School\ Climate_{school\ level}$	.09	−.09
$BV_{student\ level} \times School\ Climate_{school\ level}$	−.10***	−.06***
Elementary and middle school differences in the association between BV and student engagement		
$BV_{student\ level} \times Grade\ Level1$	.00	−.01
$BV_{school\ level} \times Grade\ Level1$	−.10	.19
Middle and high school differences in the association between BV and student engagement		
$BV_{student\ level} \times Grade\ Level2$	.06***	.02
$BV_{school\ level} \times Grade\ Level2$	.05	.26

Note. BV = bullying victimization.
* $p < .05$. *** $p < .001$.

seemingly parallel lines indicated that the moderating effect was not practically meaningful because of the small value of standardized coefficients (i.e., effect size). At the school level, $SC_{school\ level}$ had no significant moderating effects in the association between $BV_{school\ level}$ and both types of student engagement, with the control of covariates (i.e., student and school demographic factors, bullying victimization, and school climate) on student engagement.

Across student and school levels, $SC_{school\ level}$ had significant moderating effects in the association between $BV_{student\ level}$ and student engagement, with the magnitudes of moderating effects being the same across emotional and cognitive–behavioral engagement outcomes. Both significant moderating effects suggested that the negative association between bullying victimization and both types of engagement were intensified in schools with more positive school climate on average. To display the moderations, we graphed the association between bullying victimization and student engagement for school climate scores set at low (score value set at 25%ile) and high (score value set at 75%ile) levels. In schools with low school climate scores, bullying victimization was negatively associated with emotional engagement (see Figure 1) whereas it had no significant association with cognitive–behavioral engagement (see Figure 2). Even though both types of

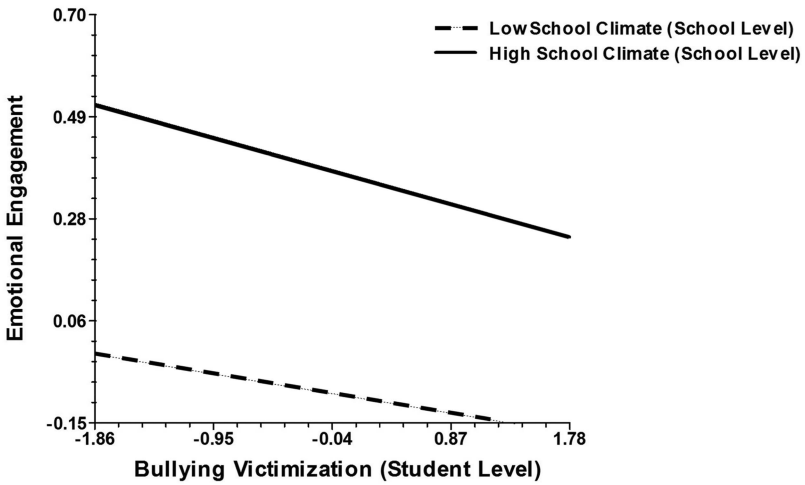

Figure 1. Moderating effect of $SC_{school\ level}$ in the association between $BV_{student\ level}$ and Emotional Engagement.

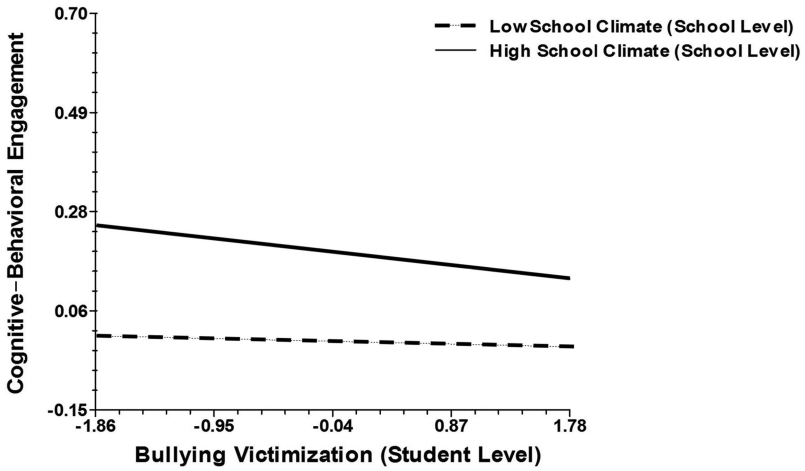

Figure 2. Moderating effects of $SC_{school\ level}$ in the association between $BV_{student\ level}$ and behavioral/cognitive engagement.

engagement were higher in high-climate schools than low-climate schools, the discrepancy between high-climate schools and low-climate schools was greater for emotional engagement than cognitive–behavioral engagement.

Moderating Effects of Grade Level

As shown in Table 2, when the strength of the association between bullying victimization (including $BV_{student\ level}$ and $BV_{school\ level}$) and student engagement (including emotional and cognitive–behavioral engagement) was compared across elementary and middle and across middle and high schools, the only significant grade-level difference was found between $BV_{student\ level}$ and emotional engagement across middle and high schools. As shown in Figure 3, middle school students reported lower emotional engagement when they experienced more frequent bullying victimization, whereas high school students' emotional engagement score did not change depending on the frequency level of their bullying victimization experience. Moreover, middle school students reported higher emotional engagement within the lower range of bullying victimization frequency whereas high school students remained at the same level of emotional engagement regardless of the change of bullying victimization frequency.

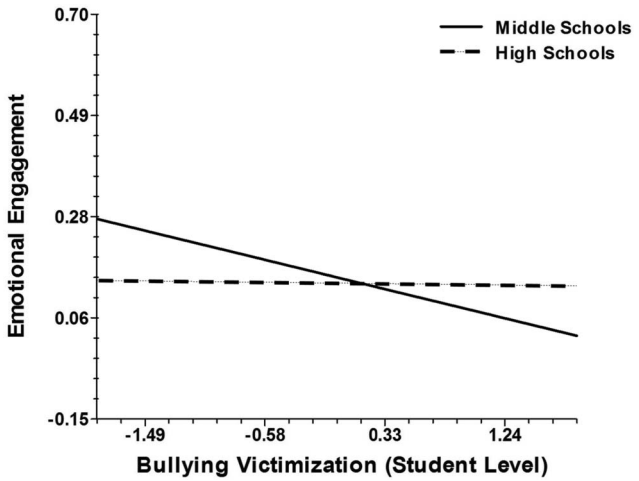

Figure 3. The Grade-level difference of the association between $BV_{student\ level}$ and emotional engagement between middle and high schools.

Discussion

This study was designed to better understand the impact of school climate on the educational consequences of bullying victimization. We investigated the influences of school climate and school level on the association between bullying victimization and student engagement. This study responded to the need for research that examines aspects of the school environment as protective factors from the harmful impacts of bullying victimization on student engagement.

School Climate

We first examined the moderating effects of school climate on student engagement controlling for demographic factors of students and schools, and the main effects of bullying victimization and school climate. We found that school-level (but not student-level) school climate was a significant and meaningful moderator of the association between student-level bullying victimization and both cognitive–behavioral and emotional engagement. However, a negative association between student-level bullying victimization and both types of student engagement was intensified in schools with higher ratings of school climate. In other words, in schools with more positive school climates, students' emotional and cognitive–behavioral engagement were more likely to be negatively impacted by bullying victimization than students in schools with more negative school climates.

The negative moderating effects of school-level school climate on the association between bullying victimization and student engagement directly contradicts our original hypothesis that school climate would buffer the impact of bullying victimization on student engagement. Although contrary to expectations, there are many possible reasons for this finding. One possibility is that in

schools with a more positive climate, the school rules and the consequences of misbehavior are conveyed more clearly, and students' expectations of being treated well by their peers may be higher; thus, their engagement outcomes may be more sensitive and reactive to the negative impact of bullying victimization. Therefore, if a student attends a school that is perceived as safe, supportive, and positive, experiencing the relatively rare and unexpected trauma of bullying victimization may be particularly damaging to that student's emotional and cognitive–behavioral engagement. Additionally, in schools with negative school climates, bullying victimization may be common enough to be an unremarkable part of the school day, with no more harmful consequences for the victim than other negative experiences that contribute to a poor school climate (i.e., negative student-teacher relationships, unfairly applied rules, and discrimination). Alternatively, there may be student or school characteristics that we were unable to measure, such as social-economic status, which are highly correlated with school climate and may influence the moderation. Further research is needed to test these possible explanations, as this surprising finding has implications for schools with positive school climate.

Although we did not find that the negative association between bullying victimization and student engagement was alleviated by positive school climate, we did find that students in schools with higher average scores of school climate endorsed higher emotional and cognitive–behavioral engagement than students in schools with lower average scores of school climate, regardless of how frequently students experienced bullying victimization. The salient association between school-level school climate and student engagement supports the role of school climate in promoting positive educational outcomes for all youth, including bullying victims (Wang & Degol, 2016). This finding replicates previous studies that have demonstrated the important role of a positive school climate on educational outcomes. For example, Cornell et al. (2016) found support for multilevel associations between an authoritative school climate model and student academic engagement for 48,027 students in Grades 9 through 12 at 323 high schools in the state of Virginia. Using the same sample, Konold and Cornell (2015) also demonstrated that an authoritative school climate is positively related to student engagement and negatively related to the prevalence of teasing and bullying.

The absence of the moderating effect of student-level school climate might be related to the fact that the student-level school climate score represents the within-school variance of school climate perception, which is largely related to individuals' personal experience with schools. When students are bullied, they are likely to have a negative personal perception of school climate, which is reflected as lower student-level school climate scores. Thus, it is difficult for student-level school climate, functioning as a malleable factor, to moderate the association between bullying victimization and student engagement. Rather, student-level perceptions of school climate might function as a mediator in the association between bullying victimization and student engagement. When students are bullied in school, they tend to have more negative perceptions associated with school. This negative school experience could lead to lower individual-level school climate scores, which further contribute to lower levels of student engagement.

The mediating role of school climate, particularly aspects of peer support or peer rejection in the association between bullying victimization and student engagement, has been supported by existing studies. For example, a recent study showed that student support, as a key factor of school climate, functioned as a full mediator in the association between prevalence of teasing and bullying and student engagement (Garcia et al., 2017). In another related study, chronic peer exclusion was found to principally mediate the link between peer rejection and classroom participation, and chronic peer abuse was found to primarily mediate the link between rejection and school avoidance (Buhs, Ladd, & Herald, 2006).

Grade Level

We also examined the moderating effects of grade level, which moderated the association between student-level bullying victimization and emotional engagement across middle and high school levels. Bullying at the student level had a more negative impact on emotional engagement for students in middle schools, whereas high school students had a relatively stable level of emotional engagement that was not significantly associated with bullying victimization.

Considering that the prevalence of bullying peaks in middle school (Felix et al., 2014), it is possible that after experiencing a "bullying culture" in middle school, high school students are less sensitive to the negative impacts of bullying victimization. With their increased independence and maturation and higher motivation for graduation, high school students might also be more capable of coping with the negative impacts of bullying victimization on their emotional engagement in schools. On the other hand, middle school students are at a more vulnerable stage because they are adjusting to the dramatic changes of school structure and social interaction when they transition from elementary to middle school settings (Brand, Felner, Shim, Seitsinger, & Dumas, 2003). They are distancing themselves from their parents yet at the same time are at the crux of challenging interpersonal experiences, such as bullying victimization. Because middle school students are in such a sensitive developmental period, perhaps those who experience less frequent bullying victimization have more positive attitudes toward their classmates and, therefore, to school. Others who do experience bullying victimization may have the lowest level of emotional engagement because of their troubled peer interactions.

Strengths and Limitations

As with all studies, there are strengths and limitations associated with this study. This study included a diverse sample representative of students attending schools in the state of Delaware. However, when the demographics of students and schools in the present study were compared with the Delaware state population, students participating in the present study underrepresented African Americans and overrepresented those from the Other Race/Ethnicity category. Also, the schools participating in the study contained a large proportion of low income students (56.39% FRPM) compared with the state total (37.8%). Follow-up studies representing various diverse populations are necessary to support the generalization of our findings.

Multilevel analysis allowed us to differentiate between individual- and school-level associations and examine the cross-level moder-

ating effects of school climate, but guidelines to determine the magnitude of the effect size of multilevel moderating effects have not been firmly established in the literature. Moreover, researchers have stated that the power to detect significant cross-level interactions is quite modest and is influenced by various factors, such as the magnitude of the cross-level interaction, the *SD* of lower level slopes, the lower and upper level sample sizes, true distributions of slopes, and standardization and centering techniques (Mathieu, Aguinis, Culpepper, & Chen, 2012). Thus, the significance of the moderating effects found in the present study should be interpreted with caution, especially considering the large sample size of the present study. Replication and follow-up studies are necessary to demonstrate the consistency of our findings and to establish the criteria for interpreting the magnitude of effect sizes in the substantive areas.

This study includes a large sample size of students and schools with an unusually wide range of valid response rates. Although DE-PBS provided schools with consistent and detailed instructions on random sampling procedures, it is possible that some schools deviated from state instructions and selected a convenience sample rather than a random sample. Analysis revealed that smaller schools and schools with more positive school climates and higher student engagement had higher valid response rates. To minimize these potential sampling biases, the school size, grade level, and school climate scores were controlled as covariate variables when the moderating effects of school climate was examined. To prevent the potential sampling bias caused by the wide range of response rates in the future studies, further guidance, and support from the Delaware PBS team to schools might increase the response rates in large middle and high schools.

Additionally, all measures were administered via student self-report and were therefore limited by single source bias. The study design was cross-sectional, therefore, no causal conclusions can be made. Additional research examining varied outcomes associated with bullying victimization is needed, as results here are limited to the outcome of student engagement. Although beyond the scope of the present study, with such a large sample and a wide array of ethnic compositions across schools, it would be meaningful to examine how students' racial/ethnic background might interact with schools' racial/ethnic composition and school climate to influence students' bullying victimization risk.

Conclusion

School bullying is the most common type of violence to occur on school campuses and is related to a range of negative outcomes, including traumatic responses (Anthors et al., 2014b). Thus, it is critical that schools develop policies and practices to actively protect students from bullying victimization. Our study suggests that school climate is strongly associated with both the cognitive–behavioral and emotional engagement among students across all grade levels, including those with frequent bullying victimization experience. This highlights the critical and fundamental role of positive school climate in bullying prevention and intervention. Results also indicated that negative associations between student-level bullying victimization and engagement were intensified by more positive school climate at the school level. This novel finding suggests that engagement in schools is more negatively influenced by bullying victimization for students in schools with more positive school climate than for students in schools with less positive school climate.

This study supported previous research that school climate is critical to support student learning and overall youth development, and that a multidimensional prevention and intervention approach is needed (Brand et al., 2003). School psychologists are in an ideal role to significantly help children recover from traumatic interpersonal experiences such as bullying victimization because they can intervene not only with the individual, but can also work to transform the school context. School psychologists are trained in and responsible for systems-level services such as school climate (National Association of School Psychologists, 2010), and can actively promote a positive school climate by implementing school-wide strategies to reinforce good behavior and proactively teach social and emotional competencies to students (Bear, Yang, Mantz, & Harris, 2017). In middle school, it may be particularly important to: address peer group values regarding academic achievement and risky behaviors; clearly communicate rules and consequences; encourage strong student-teacher relationships; and provide safety equitably for all students (Brand et al., 2003). School-wide assessments on school climate and bullying victimization might help guide schools to address areas in need of improvement and celebrate successes along the way, with the goal of promoting student engagement for all students, including those who experience trauma.

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