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Title

Teacher–Home Communication and Bullying Victimization: Do Parents' Perceptions of Fairness of Rules Matter?

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Teacher–Home Communication and Bullying Victimization: Moderating Role of Fairness of Rules Across Elementary, Middle, and High Schools

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Abstract

Guided by the social-ecological model, this study used hierarchical linear modeling to examine the associations between parental perception of teacher–home communication and parental perception of their children's bullying victimization. This study also examined the multilevel moderating effects of parental perception of fairness of rules and school levels (elementary, middle, and high schools) on the association between teacher–home communication and bullying victimization. Participants were 11,484 parents of 4th to 12th grader from 89 schools in Delaware. Controlling for student, parent, and school demographic factors, results revealed that parents' perceptions of higher level teacher–home communication and fairness of rules were both associated with parent perceived less frequent bullying victimization among their children. Moreover, the negative association between parent-level teacher–home communication and bullying victimization was significantly moderated by parents' perception of fairness of rules at both parent and school levels. Notably, the protective role of teacher–home communication on bullying victimization was stronger in schools perceived to be less fair. Additionally, the magnitude of the association between teacher–home communication and bullying victimization increased significantly across elementary, middle, and high schools. These findings highlight the importance of considering parents' perceptions of fairness of school rules and their children's grade levels in home–school engagement efforts targeting bullying and victimization.

Keywords: bullying victimization; teacher-home communication; fairness of rules; moderating effects

As the most common forms of violence at school, the experience of being the victim of school bullying has been linked to many negative outcomes, including: (a) internalizing problems, such as anxiety and depression (Reijntjes, Kamphuis, Prinzie, & Telch, 2010), (b) externalizing problems, such as aggression and delinquency (Reijntjes et al., 2011), and (c) lower academic achievement and student engagement (Authors et al., 2018a; Konold & Cornell, 2015). Leading scholars have argued that an optimal focus for bullying preventions and interventions exists in the cross-setting contexts of family and school, as both are students' primary learning and social contexts (Sheridan, Warners, & Dowd, 2004). Systematic reviews also suggest that "whole school" programs including several intervention levels and contexts across students, parents, and teachers, are the most promising approach in reducing bullying (Cantone et al., 2015). However, bullying victimization persists as a major challenge in many schools and very limited research has been conducted to understand how bullying victimization is influenced by key factors from the cross-setting context of family and school, particularly from parents' perspectives (Sheridan et al., 2004; Tam, 2007).

To address a substantial research gap and advance contemporary understanding of factors associated with bullying that may be malleable to interventions in the family-school context, the present study used a multilevel approach to examine how parental perception of teacher–home communication relates to their perception of their child's bullying victimization experience at both individual and school levels across elementary, middle, and high schools. Moreover, this study examines how the association between teacher-home communication and bullying victimization was influenced by parent perceptions of the fairness of rules in schools. Guided by the social-ecological model (Swearer & Espelage, 2004), this study investigates the importance of teacher–home communication, the perception of the fairness of rules, and grade levels as

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related to bullying victimization and uncovers the interplay of these factors. The following sections outline the key constructs and research informing this study.

The term "bullying victimization" used in the present study refers to the forms of peer victimization that most commonly appear in school and are experienced repeatedly by victims of conventional and school-focused bullying behaviors. Research has shown that students' membership in bullying process (e.g., bullies, victims, bully-victims, bystanders, defenders) showed general stability but also some changes depending on their developmental stages and contexts, thus it is difficult to define students in one specific role when their experience across a period of school years is assessed (Schafer, Korn, Brodbeck, Wolke, & Schulz, 2005). In the present study, we used the term "bullying victimization" to measure the frequency of any victimization experience related to the conventional and school-focused bullying behaviors, regardless of their role in bullying. The term "bullying victimization" is used, instead of "peer victimization," to focus on forms of victimization that most commonly appear in school and are experienced repeatedly by victims. In much of the existing literature, "bullying victimization" is often used interchangeably with the term "peer victimization," which is referred to as being a target of aggression by peers (not including siblings) and friends (Hawker & Boulton, 2000). However, researchers point out that peer victimization may also include non-bullying types of aggression, such as dating violence, peer sexual assault and harassment, property crimes, and other forms of aggression that occur outside of school or occur one time or infrequently (Turner et al., 2011).

Teacher–Home Communication and Bullying Victimization

Teacher–home communication is one important and common form of family-school engagement, which reflects the active, interactive, and dynamic processes and practices that

schools and families use as they work as partners toward the common goal to support adaptive child development (Garbacz, Herman, Thompson, & Reinke, 2017). According to sociocultural theory, children's learning is situated in context, and the communication from schools to homes has the function of signaling the value of education to the child (Olmstead, 2013). Moreover, the sender and the recipient of the "signals" could be either groups (i.e., school or family) or specific individuals (i.e., teacher, staff, or parent) and they may have different interpretations of the signal information in the communication (Epstein, Hurrelmann, Kaufmann, & Losel, 1987; Halsey, 2005). The present study focused on the perception of parents, as the recipient in the communication from teachers to home.

Previous research has suggested that teacher-home communication (e.g., teachers sending notes home to communicate with parents, daily report cards, and home visit) is an important factor in addressing many school problems, such as quality of schoolwork, academic achievement, acting-out behaviors, absenteeism, study skills, and on-task behavior across school and home settings (Cox, 2005; Evans, Okifuji, Engler, Bromley, & Tishelman 1993; Fabiano et al., 2010). In comparison to academic and behavioral difficulties, fewer studies have examined the influence of teacher-home communication on perceived bullying victimization risks, particularly from parents' perspectives. For example, a case study conducted by Sheridan and colleagues (2004) demonstrated that conjoint behavioral consultation strategies, which aim to develop partnerships among parents and educational professionals, help promote social skills and competence among children who are bullies, victims, or bystanders. Relatedly, a sizable body of research has indicated that positive parental involvement helps prevent bullying and buffering the negative effects of bullying and victimization by promoting a wide range of positive academic, social, emotional, and behavioral outcomes among children and adolescents

(Bradshaw, 2014; Tam, 2007). However, no studies have focused specifically on teacher-home communication from the parents' viewpoint. Understanding parents' perception of teacher-home communication and bullying victimization is crucial because these perceptions are associated with parent satisfaction and safety concerns with schools (Hoover-Dempsey et al., 2005), which, in turn, are associated with children's attitudes and motivation in learning and their mental health outcomes (Hill & Tyson, 2009). Parents' perceptions of bullying victimization are also related to their motivation and participation in school-based programs targeting bullying and school violence (Holt, Kaufman Kantor, & Finkelhor, 2008).

Fairness of Rules and Its Interaction with Teacher–Home Communication on Bullying Victimization. The perception of fairness in schools is an important aspect of school climate, which was defined as "the quality and character of school life" that includes "norms, values, and expectations that support people feeling socially, emotionally, and physically safe" (Cohen, McCabe, Michelli, & Pickeral, 2009, p. 182). According to the authoritative school discipline theory, school climate includes two key dimensions: social support and structure. Social support refers to the extent to which teachers/staff and peers are responsive to students' social and emotional needs, as seen in others exhibiting warmth, respect, acceptance and caring toward one another. Structure refers to the extent to which adults present and enforce clear behavioral expectations and fair rules. School climate has been recognized as one of the foremost factors influencing bullying and victimization (Wang, Berry, & Swearer, 2013). As a sub-factor of school climate, perceptions of unfairness of rules, school discipline, and justice processes in schools have been linked to increased behavioral risks among students, such as disruptive, aggressive, and hostile behaviors in the classroom (Chory-Assad & Paulsel, 2004). Moreover, perceived teacher unfairness is linked to lower sense of school safety and satisfaction with

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friends, and higher risk of violent student behaviors, including bullying (Lenzi, et al., 2014; Gini, Marino, Pozzoli & Holt, 2017). However, in all existing studies, the perception of fairness was limited to students' perceptions and none have (a) included parents' perceptions; (b) studied its association with bullying victimization; or (c) examined the moderating effect of parent-perceived fairness of rules in the association between teacher–home communication and bullying victimization. To build the literature in this neglected area and to further inform the family-school collaboration standard of school psychology practice, the present study examined how the parental perception of their children's bullying victimization experience was associated with parents' perception of teacher-home communication, fairness of school rules, and the interactions among the two factors.

The social-ecological model. The social-ecological model recognizes that bullying involves complex interactions across individuals and multiple contexts (peers, family, school, societal, and cultural influences) over time (Swearer & Espelage, 2004; Swearer & Hymel, 2015). The *multilevel*, *interactive,* and *chronicle* lenses of the theoretical framework guided the present study. The *multilevel* perspective of the model emphasizes the importance of considering the factors across the individual youth, family, school, community, and cultural contexts when understanding the antecedents and consequences of bullying behaviors (Swearer & Espelage, 2004). The *multilevel* perspective in this study supports the examination of teacher–home communication and fairness of rules' associations with bullying victimization at both individual and school levels of parental report; it also supports the consideration of student, parent, and school demographic influences as control variables.

The *interactive* aspect of the social-ecological model emphasizes the interaction between individual youths and their contexts (Lerner, 2002). The *interactive* aspect of the theoretical

framework emphasizes that bullying victimization is not simply a result of the independent or additive effects of either individual or contextual factors (Lerner, 2002). Instead, bullying victimization is the result of the *interactive or multiplicative* results of individual differences and contextual factors (Lerner, 2002). Previous research has evidenced the interactive influence of school climate on outcomes of bullying victimization outcomes, such as student engagement (Author et al., 2018b). However, research has provided limited understanding about the interactive role of school climate and the antecedents of bullying victimization. Thus, the present study focused on examining how teacher–home communication interacted with one important school climate factor – fairness of rules in schools – to influence bullying victimization.

The *chronicle* perspective of the social-ecological model highlights the importance of time as a dimension in the environment of children and adolescents. Because bullying victimization is a social phenomenon commonly occurring in schools, it is important to consider the developmental, social, and structural changes and differences across elementary, middle, and high schools when examining the antecedents related to bullying victimization issues in schools. Empirical studies suggest that the frequency and prevalence of bullying victimization and its influence on student outcomes varies across grade levels (Author et al., 2018ab). However, no prior studies have examined if the associations between teacher–home communication and bullying victimization vary across elementary, middle, and high schools. To advance knowledge in this area, the present study examined the potential moderating effect of grade level in the association between teacher-communication and bullying victimization.

The Present Study

Guided by the social-ecological model, this study examines: (1) the influences of parent-perceived teacher–home communication and fairness of rules in schools on bullying

victimization of their children at both individual and school levels; (2) the moderating effect of parental perception of fairness of rules in the association between teacher–home communication and bullying victimization; and (3) the grade level differences of the association between teacher–home communication and bullying victimization. Figure 1 provides an illustration of the hypothesized model of the present study. The demographic background of students (i.e., gender, race/ethnicity, and grade), parent (gender), and schools (i.e., school size, racial/ethnic diversity, socioeconomic background) were included as control variables.

Methods

Participants and Settings

Participants included 11,484 parents/guardians of students in 89 public schools in Delaware, representing 51 % of general education public schools in the state. The sample included 7,462 parents of students in 55 elementary schools (Grades K-5), 3,184 parents in 21 middle schools (Grades 6-8), and 838 parents in 13 high schools (Grades 9-12).

The demographic information of students (i.e., gender, race/ethnicity) and parents (gender) was self-reported by parents when they completed the Delaware School Survey. Of children of the parents responding to the survey, 45% were male and 54% were female; 50% were Caucasian, 17% African American, 15% Hispanic/Latino, 5% Asian, and 11% "Other" including participants with multiple racial backgrounds. With the exception of differences in the percentages of African American and Other race categories, the demographics largely reflected students throughout all schools in the state at that time, which were 45% Caucasian, 30% African American, 17% Hispanic/Latino, 4% Asian, and 4% Other. Among the 11,484 parents/guardians,

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12% of the parents reported that their child had a disability, 87% of the parents reported "Yes,"

and 1% of the parents reported that they did not know if their child had a disability[1].

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/calculated based on the public database provided from the

DDOE. Among the 89 schools participating the study in 2016-17, there were 73 schools (48

elementary schools, 20 middle schools, and 5 high schools) actively implementing school-wide

Positive Behavior Intervention Support by receiving professional development, technical

assistance, and coaching provided by the Delaware Positive Behavior Support (DE-PBS) Team.

In addition, 49 of the 89 schools were located in the urban area of DE, 17 schools were in the

suburban area, and 23 schools were in the rural area. The student-teacher ratio ranged from 11:1

to 22:1 with a mean of 15:1. The student/teacher ratio ranged from 11:1 to 18:1 in elementary

schools, 12:1 to 20: 1 in middle schools, and 14: 1 to 22: 1 in high schools. Among the 89

schools participating in the study in 2016-17, an average of 42% of students in the 89 schools

qualified for free or reduced-price meals; the average student enrollments were 503 students in

elementary schools, 782 in middle schools, and 937 in high schools.

Procedures

In Spring of 2017, 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 their annual assessment using the Delaware School (Student,

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[1] Based on the parent dataset collected during the school year 2015-2016, 18% of parents responded that their child was an English language learner, 75% of parents responded "Yes," and 7% pf parents responded that they did not know if their child was an English language learner. Although the parent-reported percentage of English language learners was not surveyed in the year 2016-2017, we anticipated that the statistics were similar because most of schools participating in the statewide assessment across these two school years.

Teacher/Staff, and Home versions). The Delaware School Survey includes a series of

psychometrically sound school-wide assessment instruments assessing students', parents', and

teachers' perceptions of school climate, school disciplinary practices, bullying victimization,

social-emotional competencies, and student engagement. The survey is administered annually in

more than 150 Delaware public schools (over 40,000 students, 6,000 teachers, and 20,000

parents) to help supports schools in Delaware with the implementation of school-wide behavioral

support system to prevent students' behavioral problems and promote positive outcomes for all

school members. The DDOE and the Institutional Review Board of the researchers' universities

approved all measures and procedures, which included passive consent by parents. Upon

invitation, parents in 89 out of 173 public schools completed either the electronic version or the

paper version of the survey for each of their children enrolled in school. Parents' response rates

across schools ranged from 1% to 60%, with a median of 23%. Parents' missing responses to

individual survey items ranged from 1% to 2.3%, with a mean of 1.6%. Most of the individual

survey items' missing rates were below 2%, except the survey item asking parents to report their

child's race/ethnicity (2.3%).

Measures

Parents completed the Delaware Bullying Victimization Scale–Home and the 2016

version of the Delaware School Climate Survey–Home (DSCS-H; Author et al., 2015; Author et

al., 2016). Results of reliability analysis and confirmatory factor analysis supported the reliability

and validity of both scales. Moreover, 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 multi-race/ethnicity; Author et al., 2016) for both scales. Detailed

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information about the scale's reliability and validity can be found in the technical manuals.

Bullying Victimization (BV). BV was assessed using the *Delaware Bullying Victimization Scale–Home* (DBVS–H; Author et al., 2016), which consists of 12 items measured on a 6-point Likert scale (1 = *Never,* 2 = *Less Than Once a Month,* 3 = *Once or Twice a Month,* 4 = *Once a week,* 5 = *Several Times a Week,* and 6 = *Every Day*). DBVS-H assessed parents' perceptions of how often they perceived their child has been victims of the given bullying behavior "since your child has been at this school this school year (since September)." Sample bullying behaviors include "a student said mean things to my child," and "my child was pushed or shoved on purpose." Items of DBVS-H were adapted from the *Adolescent Peer Relations Instrument: Bully/Target* (Marsh et al., 2011; Parada, 2000). Results of confirmatory factor analyses (CFA) based on the 2016-2018 statewide dataset from Delaware demonstrated that the DBVS–H is best represented by a three-factor second-order model consisting of a higher order factor of BV and three lower-order factors (i.e., physical, verbal, and relational BV), χ^2 = 2,367.73 (51, N = 16,751), p < .001; CFI = .943, RMSEA = .052, and SRMR = .044 (Author et al., 2016). Its 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 multi-race/ethnicity; Author et al., 2016). Because the three subscale scores were highly correlated, composite scores for bullying victimization were calculated based on the 12 items included in this study. Higher scores represent more frequent bullying victimization. In this study, Cronbach's alpha was .94 for all parents combined, .93 for elementary school parentss, .95 for middle school parents, and .94 for high school parents.

Teacher–Home Communication (THC). Teacher–Home Communication (THC) is a subscale of the Delaware School Climate Survey – Home (DSCS-H, Author et al., 2016). The 4-item THC scale assesses parents' perceptions of teachers' communication, respect, and help towards parents (Author et al., 2016). Using a 4-point Likert scale with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot*, parents were asked how much they agree with statements about their schools, such as "Teachers do a good job communicating with parents." In the current study, scores on the THC had Cronbach's alpha of .91 for elementary school parents, .90 for middle school parents; and both .91 for high school parents.

Fairness of Rules (FR). FR is a subscale of the Delaware School Climate Survey – Home (DSCS-H, Author et al., 2016). The 4-item FR scale assesses parents' perceptions of the fairness of school rules, classroom rules, code of conduct, and consequences of breaking rules (Author et al., 2016). Using a 4-point Likert scale with 1 = *Disagree a Lot,* 2 = *Disagree,* 3 = *Agree,* and 4 = *Agree a Lot*, parents were asked how much they agree with statements about their schools, such as "The consequences of breaking rules are fair". Its configural, weak, and strong factorial invariance was also found across grade levels, gender, and racial-ethnic groups. In the current study, scores on the FR subscale had Cronbach's alpha of .91 for elementary school parents, .89 for middle school parents; and .91 for high school parents

Statistical Analyses

Statistical analyses were conducted in two stages: (1) computation of parent- and school-level variables and interaction terms based on parent-reported survey data, and (2) a series of univariate hierarchical linear regression models (Models 1-5.2) sequentially estimated in HLM 7.0. The equations of Models 4 and 5 including their interpretations are presented in Appendix A. In the first stage, parent-reported scale scores of teacher–home communication

(THC) and fairness of rules (FR) were first aggregated at school level and then grand-mean centering to create level-2 variables (i.e., $THC_{school\ level}$ and $FR_{school\ level}$). Considering that the intraclass correlations (ICC) of THC and FR are relatively high (ICC = 8.30 % for THC and 8.14% for FR), and the range of school size and the numbers of schools are large, using aggregated school means as school-level predictors is considered minimally biased (Lüdtke et al., 2008). Other school-level demographic variables (i.e., school size, FRPM and Diversity Index) were grand-mean centered before being added into HLM models. Group-mean centering was used to compute parent-reported scale scores of THC and FR into level-1 variables (i.e., $THC_{parent\ level}$ and $FR_{parent\ level}$). By group-mean centering level-1 predictors and grand-mean centering level-2 predictors, the intercept value of the expected outcomes represents the student mean score for bullying victimization when the student-level predictors were adjusted to the average level across student populations and school-level predictors were adjusted to the average level across school populations. Following the aggregation and centering procedures, three sets of interaction terms (i.e., $THC_{parent\ level} \times FR_{parent\ level}$; $THC_{school\ level} \times FR_{school\ level}$; $THC_{school\ level} \times$ Grade_Level) were created for examining the multilevel moderating effects of school climate and grade levels. Grand-mean centering was also applied to the dependent variable of BV. The purpose of grand-mean centering to the dependent variable of BV 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, Kelcey, & Spybrook, 2017).

In the second stage, multilevel analyses were conducted in HLM 7.0 to examine the multilevel main effect of THC on BV and the moderation effects of FR and Grade Levels in the

association between THC and BV. A series of univariate hierarchical linear regression models were sequentially estimated with BV as the outcome. First, an unconditional model (Model 1) with one outcome variable and no predictors was first specified to estimate the ICC, which represents the proportion of variance in BV explained at both the parent and school levels. Then, demographic factors for parents, students and schools were added in Model 2 to examine the main effects of demographics on BV. In Model 3, $THC_{parent\ level}$ and $THC_{school\ level}$ were added to examine the student and school-level main effect of THC on BV, with the control of demographic influences. In Model 4, $FR_{parentparent\ level}$ and $FR_{school\ level}$ were added into the model as predictors to examine their multilevel main effects on BV, concurrently with the main effects of $THC_{parent\ level,}\ THC_{school\ level}$ and demographics. Also, $THC_{parent\ level} \times FR_{parent\ level}$ and $THC_{school\ level} \times FS_{school\ level}$ were added as predictors into the Model 4 to examine the student-level and school-level moderating effects of FR. In addition, $FR_{school\ level}$ was also added as predictor to the student-level regression slope between $THC_{parent\ level}$ and BV to examine the cross-level moderating effect of $FR_{school\ level}$ in the association between $THC_{parent\ level}$ and student engagement. To examine the moderating effects of grade levels, Models 1-3 were estimated again with two separate datasets: dataset A with elementary and middle school samples only and dataset B with middle and high school samples only. Using dataset A, the interaction term $FR_{school\ level} \times Grade\_Level$ was added as a school-level predictor in Model 5.1 to examine the grade level difference of the association between $THC_{school\ level}$ and BV across elementary and middle schools. Grade_Level was added as predictors to the student-level regression slope between $THC_{parent\ level}$ and BV to examine the grade level differences in the association between $THC_{parent\ level}$ and BV across elementary and middle schools. Similar procedures were conducted in Model

5.2 using dataset B to examine the grade level differences in the association between $THC_{parent\ level}$ and BV and $THC_{parent\ level}$ and BV across middle and high schools.

The standardized coefficients, standard error, t ratio, and p value estimated in the models were used to examine the magnitude and practical importance of the main and moderating effects. The magnitude of effect sizes was generally determined using the criteria suggested by Rosenthal and Rosnow (1984). As such, effects of .50 standard deviation or more in magnitude are viewed as large, .30 to .50 as moderate, .10 to .30 as small, and below .10 as trivial. The criteria should be used with caution because the there is still a lack of consistency and agreement among researchers about how to calculate the effect size and interpret the magnitude of effect size in the context of multilevel analyses. To visualize the significant moderating effects, presentations were created using Model Graph within HLM 7.0 to represent the association between teacher–home communication and BV at different levels of fairness of rules (i.e., 25th percentile value and 75th percentile value) and different grade levels (i.e., elementary, middle, and high school levels). When the models were estimated in HLM, listwise deletion was performed as the default for missing data during the MDM creation process. After the listwise deletion procedure, the remaining level-1 sample size is 9,280 and level-2 sample size is 89, which are considered large sample sizes with sufficient power for conducting multilevel modeling analyses. According to the recommendation provided by previous researchers, it is reasonable to use listwise deletion over maximum likelihood or multiple imputation if it still yields a large sample. Moreover, researchers have argued produced unbiased regression slope estimates when missing is not a function of outcome variable (Allison, 2014). When Little's MCAR test was conducted using SPSS among all the individual survey items used in the study, it suggested that the data were not missing completely at random. However, further analyses

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suggested the missingness was not a function of the outcome variable – bullying victimization. Thus, it supported the use of list-wise deletion, which could produce unbiased regression slope estimates."

Results

Results of Descriptive and Correlational Analyses

Correlational Analyses showed that the teacher-reported scores (Mean = 3.31, SD = 0.57 for THC, Mean = 3.31, 0.52 for FR, and Mean = 1.38, SD = 0.64 for BV), computed teacher-level (level-1) scores, and school-level (level-2) scores of THC, FR, and BV were all significantly correlated. Across parent and school levels, THC and FS had stronger correlations ($r = .75 \sim .91$) than BV's correlations with THC and FR ($r = -.22 \sim -.40$). School size was significantly correlated with school-level aggregated THC ($r = -.48$) and FR ($r = -.39$), but not with BV ($r = -.07$). Percentage of FRPM (students receiving free and reduced priced meals) was correlated with school size ($r = -.30$) and BV ($r = -.46$). The racial/ethnic diversity index had no significant correlations with other school-level reported or aggregated variables.

School Level Effects

The ICC values based on the unconditional model (Model 1) indicated that 1.55% of the variance in parents' perceptions of their child's BV could be explained by factors at the school level, leaving 98.45% accounted for at the individual parent level. Moreover, the design effect is 2.98, indicating that the school clustering effect needs to be taken into account during the estimation.

Main Effects of Teacher–home Communication and Fairness of Rules

When the main effects of demographic factors of students, parents, and schools on BV were examined in Model 2, students' race/ethnicity, grade, and grade levels were found to have

significant associations with BV, with the strengths of the associations ranging from small to moderate range (see Table 1). More specifically, parents of Asian or Hispanic students reported less frequent bullying victimization than parents of African and Caucasian students and there was no significant difference between parents of African and Caucasian students on their perceived bullying victimization experiences of their children. Parents of students in higher grades reported that their children experienced more frequent bullying victimization than parents with children in lower grades. Also, parents of middle school students reported significantly higher frequency of bullying victimization experienced by their children than parents of elementary and high school students. Moreover, parents in schools with higher percentage of students receiving FRPM tended to report more frequent bullying victimization experienced by their children. The gender of students and parents, school size, and racial/ethnic diversity index did not significantly relate to student bullying victimization based on parents' report. In Model 4, with the control of student and school demographic backgrounds and the concurrent moderating effect of fairness of rules, both THC and FR significantly and negatively associated with BV at the individual parent level, but not the school level (see Table 1). In other words, for parents who personally perceived schools as a place with less fair school rules and lower quality of communication between teachers and home, they tended to perceive their children experiencing higher frequency of bullying victimization. The magnitude of the significant main effect of THC and FR on BV was in the small range.

Table 1

Statistical Estimates of Multilevel Main Effects and Moderation Effects

	Model2	Model3	Models 4	Models 5.1	Models 5.2
Intercepts	0.00 (0.10)	0.01 (0.01)	- 0.04 (0.01)***	- 0.01 (0.01)	0.01 (0.02)
Individual Parent level					

Student Gender	- 0.01(0.02)	- 0.01(0.01)	- 0.01 (0.01)	- 0.00 (0.01)	- 0.06 (0.03)
Guardian Gender	0.03(0.02)	0.03(0.02)	0.03 (0.02)	0.03 (0.02)	0.02 (0.04)
Race/Ethnicity					
Caucasian v.s. African American	0.02(0.02)	0.02 (0.02)	0.03 (0.02)	0.02 (0.02)	0.03 (0.04)
Hispanic v.s. African American	- 0.20(0.03)***	- 0.17 (0.03)***	- 0.16 (0.03)***	- 0.16 (0.03)***	- 0.15 (0.06)*
Asian v.s. African American	- 0.17(0.04)***	- 0.15 (0.04)***	- 0.13 (0.04)***	- 0.14 (0.04)***	- 0.11 (0.06)
Other Race v.s. African American	- 0.01(0.03)	- 0.02 (0.03)	- 0.01 (0.03)	- 0.01 (0.03)	0.00 (0.06)
Grade (related to age)	0.02 (0.01)***	0.01 (0.01)**	0.02 (0.01)**	0.01(0.01)*	0.01 (0.02)
School level					
Grade Level					
Elementary v.s. Middle	- 0.05 (0.02)*	0.05 (0.03)	0.04 (0.03)	0.10 (0.03)**	-
High v.s. Middle	- 0.09 (0.04)*	- 0.14 (0.04)***	- 0.15 (0.04)***	-	- 0.18 (0.05)***
Racial/Ethnic Diversity Index	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	- 0.01 (0.01)	
School Size	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.02 (0.00)**	
FRPM	0.02 (0.01)**	0.01 (0.00)*	0.01 (0.01)*	0.02 (0.00)**	
Main Effects of THC and Fairness					
$THC_{parent\ level}$		- 0.26 (0.02)***	- 0.12 (0.02)***	- 0.26 (0.02)***	- 0.31 (0.04)***
$THC_{school\ level}$		- 0.37 (0.08)***	- 0.24 (0.15)	- 0.42 (0.09)***	- 0.66 (0.15)***
$Fairness_{parent\ level}$			- 0.20 (0.03)***		
$Fairness_{school\ level}$			- 0.18 (0.15)		
Moderating Effects of Fairness in the Association between THC and BV					
$THC_{parent\ level}$ x $Fairness_{parent\ level}$			0.21 (0.04)***		
$THC_{parent\ level}$ x $Fairness_{school\ level}$			0.38 (0.11)***		
$THC_{school\ level}$ x $Fairness_{school\ level}$			0.41 (0.28)		
Grade Level in the Association between THC and BV across Elementary and Middle Schools					
$THC_{parent\ level}$ x Grade Level				0.06 (0.04)	
$THC_{school\ level}$ x Grade Level				0.39 (0.17)*	
Grade Level in the Association between THC and BV across Middle and High Schools					

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THC$_{parent\ level}$ x Grade Level					0.01 (0.08)
THC$_{school\ level}$ x Grade Level					0.52 (0.25)*
Variance Component					
Parent-level Estimate (σ^2)	0.378	0.435	0.335	0.366	0.461
School-level Estimate (τ^{00})	0.005***	0.003***	0.004***	0.002**	0.004

Note. THC = Teacher–Home Communication, FRPM = Percentages of Students Receiving Free or Reduced Price Meals ;

Variance Component

*p < .05; **p < .01; ***p < .001.

Moderating Effects of Fairness of Rules

Models 4 showed that the fairness of rules perceived by parents at the individual level (FR$_{parent\ level}$) and school-average level (FR$_{school\ level}$) were found to significantly moderate the association between THC$_{parent\ level}$ and BV, with the strengths of the association in the small to moderate range (see Table 1). Consistently, the negative association between THC$_{parent\ level}$ and BV was stronger in schools with lower FR$_{parent\ level}$ or lower FR$_{school\ level}$. As shown in Figure 2, in comparison to parents perceiving higher FR$_{school\ level}$, parents perceiving lower FR$_{school\ level}$ reported that their children experienced more frequent BV under the condition of less positive THC$_{parent\ level}$; they also perceived that their children experienced less frequent BV under the condition of more positive THC$_{parent\ level}$. As shown in Figure 3, parents with higher FR$_{parent\ level}$ reported their children experiencing more BV regardless of the level of THC$_{parent\ level}$. Moreover, the negative association between THC$_{parent\ level}$ and BV was negligible among parents with lower FR$_{parent\ level}$.

Moderating Effects of Grade Level

Significant grade-level differences were found in the association between THC$_{school\ level}$ and BV, but not between THC$_{parent\ level}$ and BV (see Table 1). More specifically, the magnitude of

the negative association between $THC_{school\ level}$ and BV increased significantly with the increase

of grade level (high> middle> elementary) and the significant moderating effects of grade level

were in the moderate to large range. Figure 4 illustrates that middle school parents reported more

frequent BV of their children than high school parents under the condition of lower $THC_{school\ level,}$

whereas they reported less frequent BV of their children than high school parents under the

condition of higher $THC_{school\ level.}$ As shown in Figure 5, middle school parents reported less

frequent BV of their children than high school parents, regardless of the level of $THC_{school\ level.}$

Discussion

In order to advance knowledge regarding the importance and impact of family-school

collaboration, the present study examined parental perceptions of teacher–home communication

as related to parental perceptions of student experiences of bullying victimization. Controlling

for student, parent, and school-level demographic factors, multilevel modeling revealed how this

association was related to parental perception of fairness of rules in schools and the schools'

grade levels. This study was guided by the social-ecological model and the main effect and

moderating effects were examined at both parent and school levels and across parent and school

levels. Findings highlight the importance of parental perception of teacher–home communication

and fairness of rules in bullying prevention; it is also important to concurrently consider parents'

perception of fairness of rules and students' grade levels when implementing teacher–home

communication strategies to reduce bullying and victimization.

Main Effect of Individual and School Demographics, Teacher–Home Communication and

Fairness of Rules

Although not a primary focus of the study, we found that parent perceived bullying

victimization experiences of their children were significantly associated with several

demographic factors, such as race/ethnicity, grade, grade level, and school's percentage of students receiving free or reduced-price meal. Parents of Asian and Hispanic children experienced less frequent overall bullying victimization than parents of African American and Caucasian students. This finding is consistent with other studies on racial/ethnic differences of bullying victimization based on student report (Hanish & Guerra, 2000; Peguero & Williams, 2013). Parents from schools with high percentage of students receiving FRPM reported that their children experienced more frequent bullying victimization. Consistent with this finding, a previous meta-analysis also found that victims and bully-victims were more likely to come from low socioeconomic households (Tippett & Wolke, 2014). The grade-level (i.e., elementary, middle, and high school) differences of students' bullying victimization in this study, as reported by parents are consistent with previous student-reported findings that the overall victimization tends to peak in middle school and follow a decline in high school (DeVoe, Peter, Noonan, Snyder, & Baum, 2005). When the association between grades (4th to 12th grade) and bullying victimization was examined, it showed that parent reported bullying victimization increased with the grade. This finding is contradictory with the previous student-reported finding that younger children tended to report higher level of victimization compared to older children (Smith, Madsen, & Moody, 1999). This inconsistent finding might be contributed to the differing opinions on the definitions of bullying victimization between parents and children and between children with different age (Smith et al., 1999). Research also found children and adults (i.e., teachers and parents) tend to have disagreement on the rates of certain types of victimization (Demaray, Malecki, Secord, & Lyell, 2013). Considering the significant influences of certain demographic factors on parents' perception of bullying victimization, it is important to recognize

and be sensitive to the diverse backgrounds of parent and their children in the implementation of school climate and school bullying programs.

When the multilevel main effects of teacher–home communication, and fairness of rules on bullying victimization were examined concurrently based on parents' perceptions, both factors were negatively and significantly associated with bullying victimization at the individual parent level, but not the school level. Existing research on teacher–home communication has focused primarily on its impact on youth social-emotional, behavioral, and academic outcomes, with limited consideration of the impacts specifically on bullying victimization (Cox, 2005; National Academies of Sciences, Engineering, and Medicine, 2016). By validating the linkages between teacher–home communication and bullying victimization, this study has expanded the scope of student outcomes that could be improved by teacher–home communication practice and family-based prevention programs. This is also the first study to demonstrate that parent perceptions support the link between fairness of rules and bullying victimization. Moreover, the significant linkage found at the individual parent level, but not at the school level, indicated that parents' individual communication experiences with teachers and personal perceptions of how fairly their children are treated in schools had a stronger influence on their perceptions of bullying victimization than their school-wide perceptions based on all families, teachers, and students in the school. It also suggests that parents' experience and attitudes vary largely. Thus, it is important to attend to individual parents' personal experience and attitudes and provide selected and targeted support to parents beyond universal-level prevention and intervention.

Moderating Effects of Fairness of Rules

The association between parent perception of teacher–home communication and bullying victimization was moderated by their perception of fairness of rules in schools. More

specifically, the protective role of teacher–home communication (at the individual parent level) on bullying victimization was stronger in schools with lower compared to higher levels of parent perceived fairness of rules. It is plausible that when parents perceive schools to have higher fairness of rules, they also have stronger trust in schools' disciplinary practices when their children experience bullying at school. They may believe that schools will appropriately handle bullying victimization, thus, seeking and maintaining frequent and close communication with teachers and schools would not be related to their child's experience of bullying. In contrast, in schools where parents individually and collectively perceive low levels of fairness of rules, parents or teachers alike may feel that individual parent-teacher communication is necessary to prevent bullying victimization.

Moreover, in understanding the moderating effects of fairness of rules, the correlational aspect of the research might also help explain this finding. Prior research has established that bullying victimization occurs less frequently in schools with strong climates (Waasdorp, Bradshaw, & Duong, 2011). Thus, within schools at the highest quartile of parent perceived fairness or rules, it is likely that bullying victimization is relatively infrequent. Parents who perceive schools to be low in fairness may regularly initiate home school collaboration due to high levels of perceived bullying victimization. Longitudinal research examining the direction of effects is necessary to test these hypotheses.

Moderating Effects of Grade Level

Across all grade levels, when parents at the school level perceived higher levels of teacher–home communication, they were less likely to perceive that their child experienced bullying victimization. It was notable that the magnitude of the negative association between school-level teacher–home communication and bullying victimization increased significantly

from elementary to middle to high school levels. Prior research has demonstrated that parents are typically less involved in their child's school as they move from elementary through high school (Green, Walker, Hoover-Dempsey, & Sandler, 2007). Thus, in elementary school, it is likely that teacher–home communication is not as highly related to a specific safety issue such as bullying victimization because there are school-wide many structures in place to support teacher–home communication. However, as students mature and less regular parent engagement naturally occurs, when parents across a school perceive strong teacher–home communication, they are also less likely to report that their child experiences bullying victimization. These results indicate that teacher–home communication is a key aspect of bullying victimization prevention, especially as children get older and teacher–home connections are less likely to naturally occur.

Limitations and Future Directions

There are strengths and limitations associated with this study. Recognizing that parent perceptions of teacher-school communication, fairness of rules, and their children's bullying victimization experience differs for families from different backgrounds, the study represented a large and diverse sample of parents of students attending schools across the state of Delaware. However, results may not generalize to all parents. Also, the present study aimed to address limited knowledge about parents' role in bullying victimization by focusing on parents' perception of teacher–home communication and fairness of rules in schools. Recognizing the dynamic and interactive process between parents and teachers is vital to developing successful collaborative relationships, it is important to use multi-informant approaches in future studies to study the concurrent and reciprocal perception from both parents and teachers. Moreover, research has found that student perceived parental pressure to intervene as a bystander to bullying victimization was positively associated with students taking responsibility for

intervention as well as coping when in a bullying victimization context (Pozzoli & Gini, 2012).

Thus, it is also important to include students as the informant and study the impact of family–

school engagement practice on perceived bullying victimization from all student, parent, and

teacher perspectives. Another limitation of this study was the response rates of the parents. A

median rate of 23% is low, but not uncommon in such large-scale research. A follow-up analysis

suggested that in schools with relatively higher response rate (response rate >= 23%), school-

level mean scores of parent perceived fairness of rules and teacher-home communication was

slightly higher than schools with relatively low response rate (response rate < 23%). In contrast,

school-level mean score of bullying victimization was slightly lower in schools with relatively

higher response rate (response rate >= 23%). Thus, it is important to interpret results with the

caution that parents' perception about schools could potentially influence their willingness to

participate in the survey study. Future research should consider recruitment strategies that

encourage a larger proportion of parents to participate and minimize the influence of parents'

perception on their survey performance. In addition, considering the salient influence of school

climate on bullying victimization, it is important to further explore the role of other important

school climate sub-factors, such as teacher-student relations, student-student relations, clarity of

expectations interact with teacher-home communication to influence bullying victimization in

future studies.

Practical Implications

Prior research has established the importance of the fairness of rules on increasing school

climate and reducing bullying victimization and other forms of school violence (Lenzi et al.,

2015). The results of this study further suggested that teacher-home communication interacts

with parents' perception of fairness of rules to influence the bullying victimization risks of

students. Thus, for schools seeking to reduce levels of bullying victimization, focusing on establishing and communicating fair rules across the entire school context, including parents, is critical and may reduce the need for other more intensive interventions. School psychologists play a critical role in keeping schools safe for all school members, particularly students. Thus, they are key school professionals to develop interventions to address bullying victimization (Espelage, Hong, & Mebane, 2016). For school psychologists who find themselves in schools where parents perceive low fairness of rules, their efforts to enhance home–school communication appear crucial. To improve the home-school communication and maximize school psychologists' positive role in the communication process, further investigation of programs and practice models that support school psychologists, parents, and teachers working together to address bullying victimization, such as the conjoint-behavior consultation model (Sheridan et al., 2017), is warranted. Moreover, considering that many of the sample schools have been implementing Positive Behavior Intervention Support (PBIS), it is important for educators and staff who are implementing PBIS to recognize the importance of parents' perception of teacher-home communication, school climate, and school discipline and their involvement in addressing bullying. It is also important to integrate home-school engagement component into the multi-component PBIS framework by providing parents with interactive and educational sessions focusing on behavior support, social-emotional learning, and parent monitoring.

Conclusion

This study provides empirical evidence supporting the rule of parents' perceptions of family-school communication and fairness of school rules in bullying prevention. School climate research has demonstrated the importance of positive parent-teacher relationships in preventing

the harmful effects of bullying victimization (Bosworth, Espelage, & Simon, 1999); this is the first study to establish the link between teacher–home communication, fairness of rules, and bullying victimization from the parent perspective. These findings suggest that it is important to take into consideration parents' perceptions of fairness of rules and grade levels of schools when planning the home–school collaboration efforts that aim to reduce bullying victimization risks among children and adolescents.

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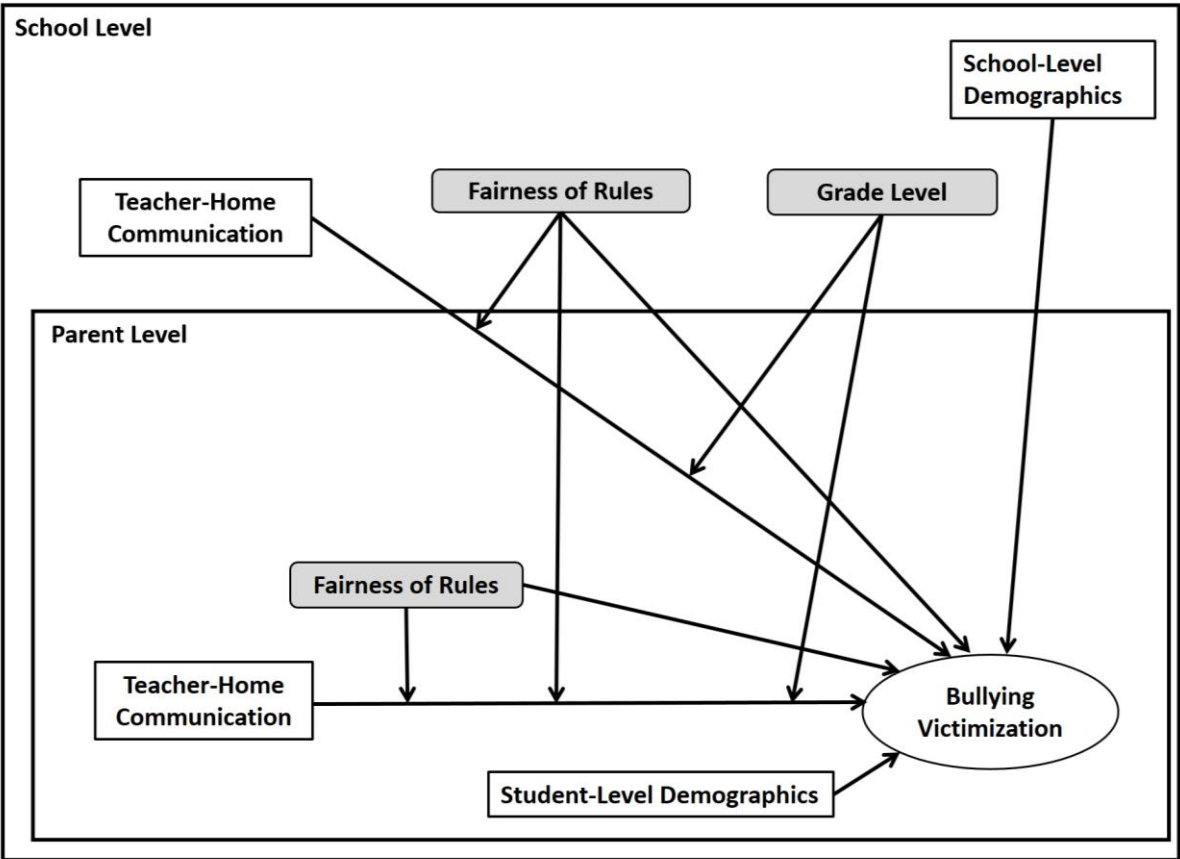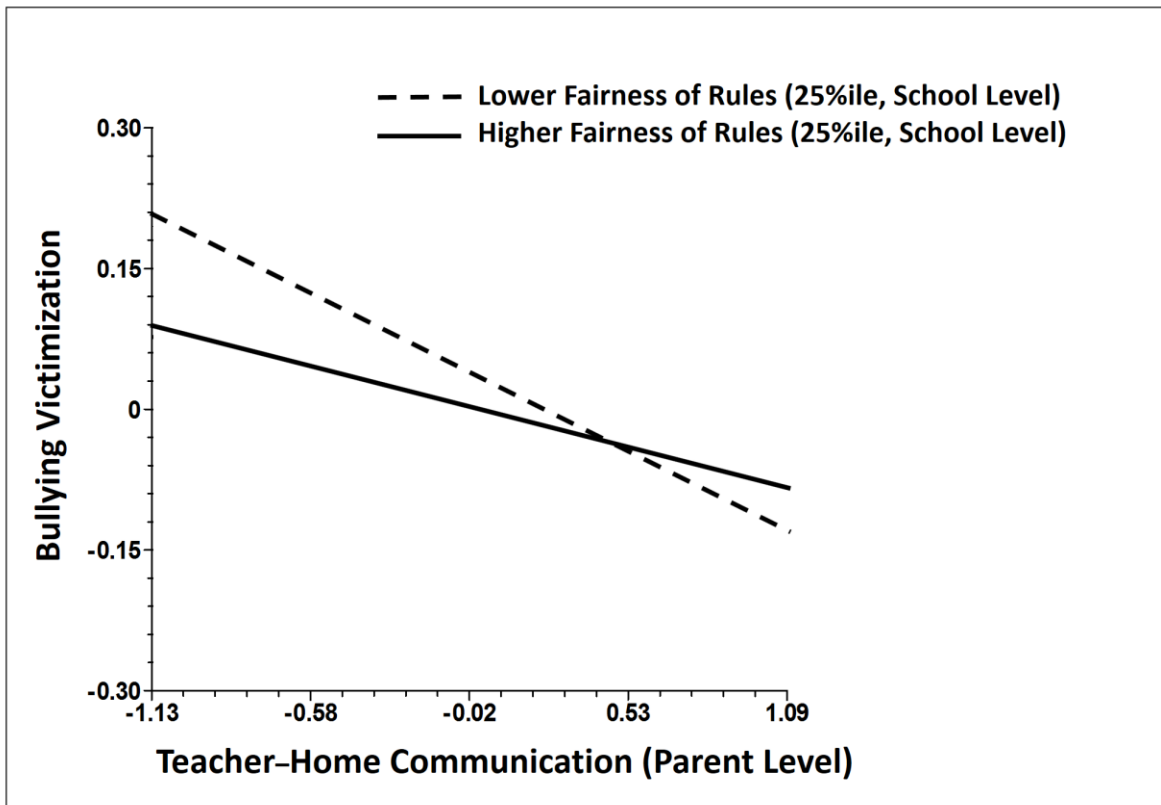
Figure 1. Hypothesized Model

Figure 2. The moderating effect of Fairness of Rules (School Level) in the Association between

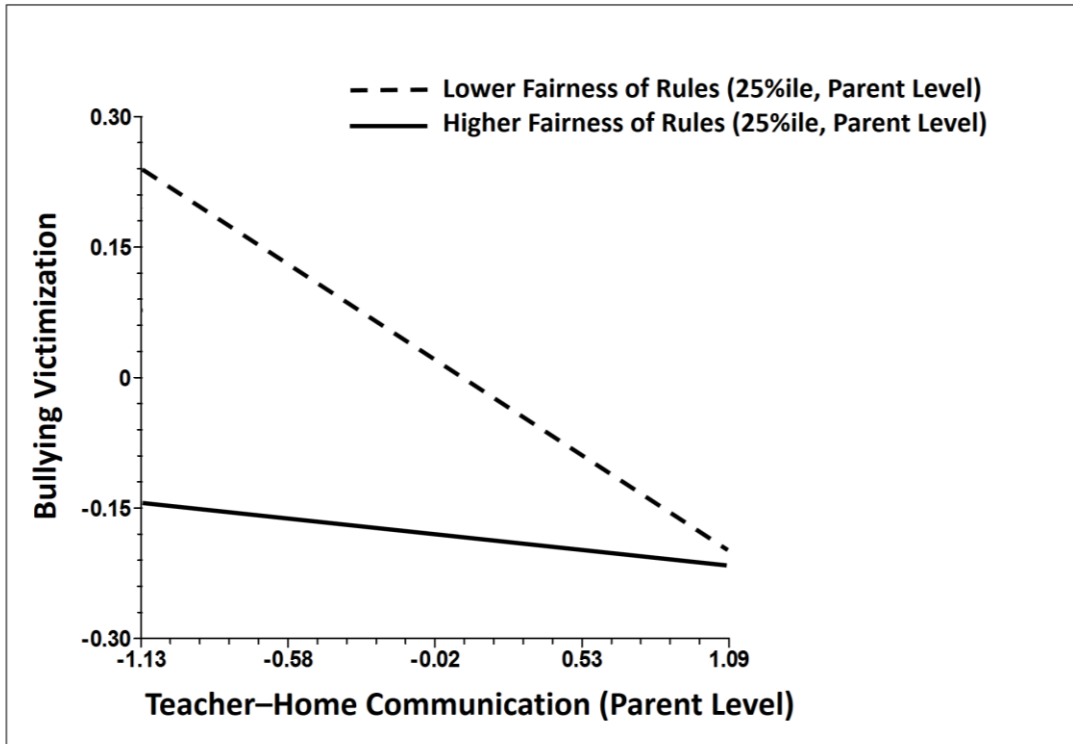Teacher–Home Communication (Individual Parent Level) and Bullying Victimization

Figure 3. The moderating effect of Fairness of Rules (Individual Parent Level) in the Association between Teacher–Home Communication (Individual Parent Level) and Bullying Victimization
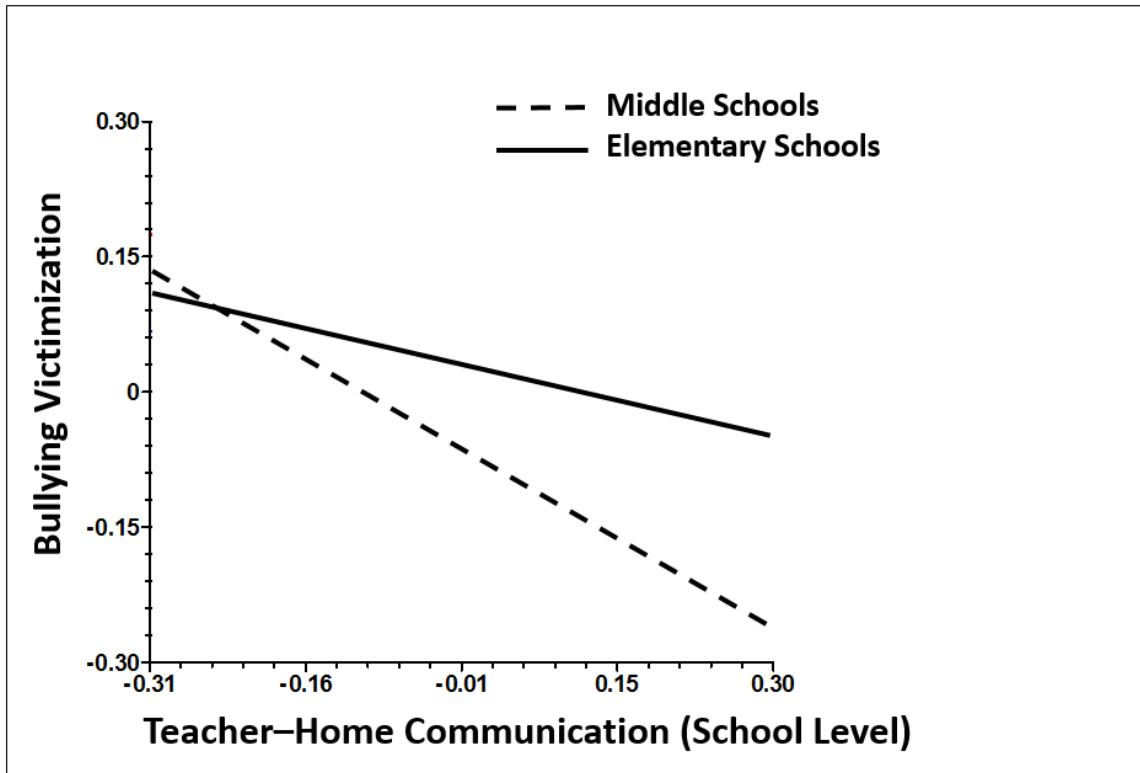
Figure 4. Grade-level Differences of the Association between Teacher–Home Communication

(School Level) and Bullying Victimization across Elementary and Middle Schools
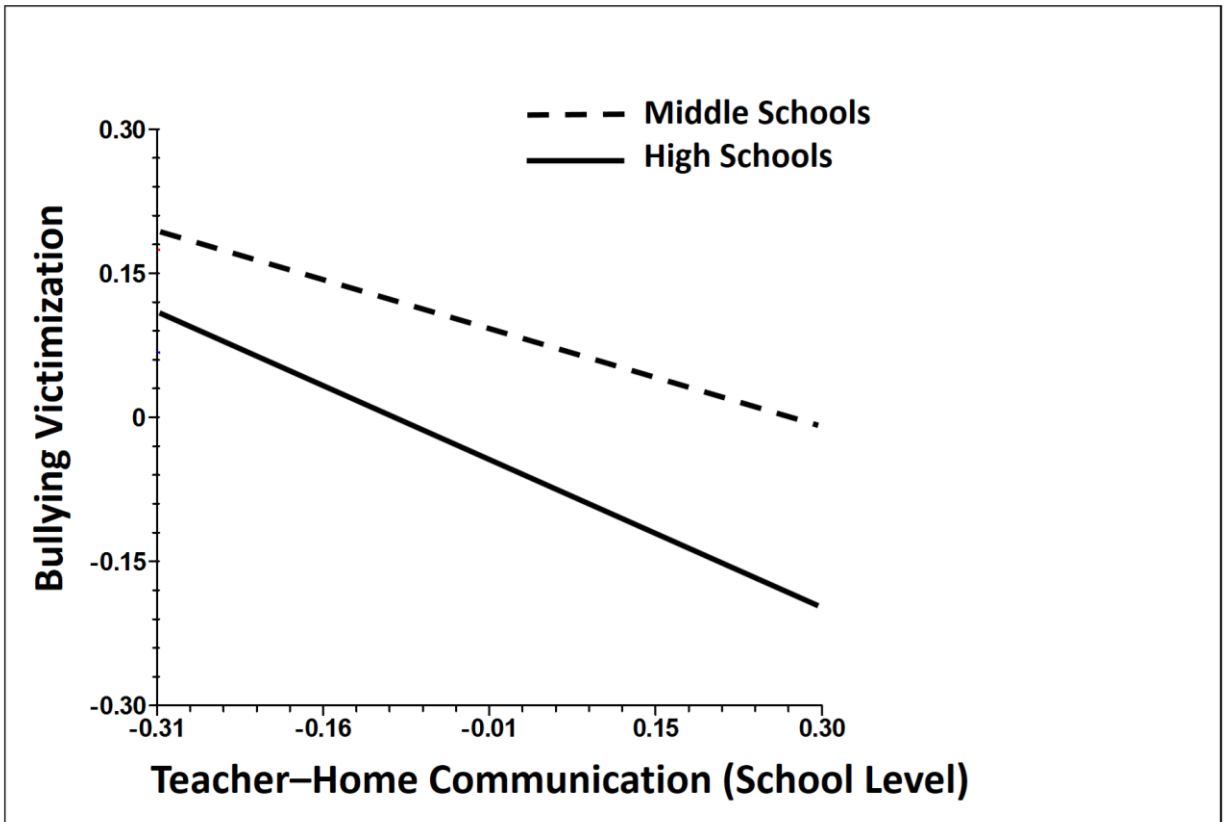
Figure 5. Grade-level Differences of the Association between Teacher–Home Communication

(School Level) and Bullying Victimization across Middle and High Schools

Appendix A: Equations of Models 4 and 5

1. **Equation and interpretation for Model 4**

   <u>**Student-Level (Level-1) Models**</u>
   $$Bullying\ Victimization_{ij} = \beta_{0j} + \beta_{1j}(Fairness_{ij}) + \beta_{2j}(HSC_{ij})$$
   $$+ \beta_{3j}(Fairness_{ij} \times HSC_{ij})$$
   $$+ \theta_j(Individual\_Demographics_{ij}) + r_{ij}$$

   <u>**School-Level (Level-2) Models**</u>

   $$\beta_{0j} = \gamma_{00} + \gamma_{01}(\overline{Fairness_j}) + \gamma_{02}(\overline{HSC_j})$$
   $$+\gamma_{03}(\overline{Fairness_j} \times \overline{HSC_j})$$
   $$+\varphi(School\_Demographics_j) + u_{0j}$$
   $$\beta_{1j} = \gamma_{10} + \gamma_{11}(\overline{HSC_j}) + u_{1j}$$
   $$\beta_{2j} = \gamma_{20} + u_{2j}$$
   $$\beta_{3j} = \gamma_{30} + u_{3j}$$
   $$\theta_j = \gamma_{40} + u_{4j}$$

   1) Subscript i represents parents$\{1, 2, \ldots n_j\}$ per school, while subscript j represents schools $\{1, 2, \ldots , 89\}$;

   2) *Bullying Victimization$_{ij}$* is the ground-mean centered outcome variable of Bullying Victimization for parent i in school j;

   3) β_{0j} is the random intercept for school j;

   4) β_{1j} is the main effect in school j of Fairness$_{ij}$, a group-mean centered continuous predictor representing Fairness of School Rules (Fairness);

   5) β_{2j} is the main effect in school j of THC$_{ij}$, a group-mean centered continuous predictor representing Teacher-Home Communication (THC);

6) β_{3j} is the main effect of the individual-level moderation term THC_{ij} x $Fairness_{ij}$, both THC_{ij} and $Fairness_{ij}$ are group-mean centered continuously predictors representing Teacher-Home Communication and Fairness of School Rules, respectively;

7) θ_j is a vector of main effects multiplied by a vector of *Student_Demographics$_{ij}$*, which includes five individual-level demographic factors: gender (dummy coded as Gender_D) and race/ethnicity (dummy coded as Race_D1, Race_D2, Race_D3, and Race_D4). These categorical variables are centered on their school means;

8) r_{ij} is the error term associated with parent *i* in school *j* and is assumed to be randomly distributed with a mean of 0 and variance σ^2;

9) γ_{00} is the average group intercept, or predicted grand-mean outcome at the school level in the population;

10) γ_{01} is the main effect on *Bullying Victimization* by $\overline{Fairness}_j$, a grand-mean centered continuous predictor representing the school average score of Fairness of School Rules (Fairness);

11) γ_{02} is the main effect on *Bullying Victimization* by $\overline{HSC}_j$, a grand-mean centered continuous predictor representing the school average score of home-school communication (HSC);

12) γ_{03} is the main effect on *Bullying Victimization* by the moderation term of $\overline{Fairness}_j \times \overline{HSC}_j$, both $\overline{Fairness}_j$ and $\overline{HSC}_j$ are group-mean centered continuously predictors representing Fairness of School Rules and Teacher-Home Communication, respectively;

13) φ is a vector of main effects multiplied by a vector of *Student_Demographics$_j$*, including school-level school size, grade level, percentage of students receiving free lunch, and the racial/ethnic diversity index. The categorical variable for grade levels is dummy coded (Grade Level_D) and centered on the grand mean; continuous variables are also centered on grand means;

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

15) γ_{10} and γ_{20} are the mean effects of student-level Fairness$_{ij}$ and HSC$_{ij}$ averaged across the j schools;

16) γ_{30} is the mean effects of school-level moderation terms $Fairness_{ij} \times HSC_{ij}$ averaged across the j schools;

17) γ_{40} is a cluster of the mean effects of Student_Demographics$_{ij}$ averaged across the j schools;

18) γ_{11} is the cross-level moderating effects of school-level $\overline{HSC}_j$ on the relationship between student-level Fairness$_{ij}$ and *Bullying Victimization*;

19) u_{1j} through u_{4j} are the the random effects for the Fairness$_{ij}$, HSC$_{ij}$, and $Fairness_{ij} \times HSC_{ij}$ slope for school j;

2. Equation for Model 5

Student-Level (Level-1) Models

$$Student\_Engagement_{ij} = \beta_{0j} + \beta_{1j}(CBV_{ij}) + \beta_{2j}(TBV_{ij}) + \beta_{3j}(SC_{ij})$$

$$+ \theta_j(Student\_Demographics_{ij}) + r_{ij}$$

School-Level (Level-2) Models

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\overline{CBV}_j) + \gamma_{02}(\overline{TBV}_j) + \gamma_{03}(\overline{SC}_j)$$

$$+\gamma_{04}(\overline{CBV}_j \times \overline{Grade\ Level\_D}_j)$$

$$+\varphi(School\_Demographics_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\overline{Grade\ Level\_D}_j) + u_{1j}$$

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

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

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

$$\theta_j = \gamma_{80}$$

20) Subscript *i* represents students {1, 2, … n_j} per school, while subscript *j* represents schools {1, 2, … , 43};

21) *Student_Engagement$_{ij}$* is the outcome variable of Student Engagement for student i in school j; in each set of model, one type of student engagement was added as the outcome.

22) β_{0j} is the random intercept for school *j*;

23) β_{1j} is the main effect in school *j* of C*BV$_{ij}$*, a group-mean centered continuous predictor representing cyberbullying victimization (CBV);

24) β_{2j} is the main effect in school *j* of T*BV$_{ij}$*, a group-mean centered continuous predictor representing traditional bullying victimization (TBV);

25) β_{3j} is the main effect in school *j* of SC$_{ij}$, a group-mean centered continuous predictor representing school climate (SC);

26) θ_j is a vector of main effects multiplied by a vector of *Student_Demographics$_{ij}$*, which includes five individual-level demographic factors: gender (dummy coded as Gender_D) and race/ethnicity (dummy coded as Race_D1, Race_D2, Race_D3, and Race_D4). These categorical variables are centered on their school means;

27) r_{ij} is the error term associated with student *i* in school *j* and is assumed to be randomly distributed with a mean of 0 and variance σ^2;

28) γ_{00} is the average group intercept, or predicted grand-mean outcome at the school level in the population;

29) γ_{01} is the main effect on *Student_Engagement* by $\overline{CBV}_j$, a grand-mean centered continuous predictor representing the school average score of cyberbullying victimization (CBV);

30) γ_{02} is the main effect on *Student_Engagement* by $\overline{TBV}_j$, a grand-mean centered continuous predictor representing the school average score of traditional bullying victimization (TBV);

31) γ_{03} is the main effect on *Student_Engagement* by $\overline{SC}_j$, a grand-mean centered continuous predictor representing the school average score of school climate (SC);

32) φ is a vector of main effects multiplied by a vector of *Student_Demographics$_j$*, including school-level school size, grade level, percentage of students receiving free lunch, and the

racial/ethnic diversity index. The categorical variable for grade levels is dummy coded (Grade level_D) and centered on the grand mean; continuous variables are also centered on grand means;

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

34) γ_{10} through γ_{30} is the mean effect of student-level CBV_{ij}, $TBV_{ij,}$ and SC_{ij} averaged across the j schools;

35) γ_{40} is the mean effects of student-level moderation terms $CBV_{ij} \times SC_{ij}$ averaged across the j schools;

36) γ_{50} is a cluster of the mean effects of Student_Demographics$_{ij}$ averaged across the j schools;

37) γ_{11} is the cross-level moderating effects of school-level $\overline{SC}_j$ on the relationship between student-level CBV_{ij} and *Student_Engagement;*

38) u_{1j} is the random effect for the CBV_{ij} slope for school j;