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THE IMPACT OF SCHOOL NEIGHBORHOOD DISADVANTAGE ON BULLYING:  
EXAMINING THE ROLE OF SCHOOL CLIMATE

By

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## ABSTRACT OF THE DISSERTATION

The Impact of School Neighborhood Disadvantage On Bullying: Examining the Role of  
School Climate

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This study sought to examine bullying in schools from an ecological systems perspective by assessing the role that important aspects of the school and neighborhood microsystems play in shaping student behavior and experiences. Specifically, this study examined whether school neighborhood socioeconomic status (SNSES) and school climate were associated with student reports of bullying, victimization, and others being bullied at school. The interaction between SNSES and school climate was also assessed. The sample included 9,603 students from 26 schools (49.7% were female and 50.1% self-identified as White, 15.7% as Latino, 12.3% as Mixed race/ethnicity, 7.1% as Black, 6.5% as Asian, 2.7% as Middle Eastern and 5.4% as Other). Student grade levels ranged from 3 to 12. Bullying and school climate were assessed via student report. SNSES was assessed via 2000 U.S. Census data. Multilevel linear modeling was used to examine the study hypotheses. Results revealed that negative school climate and negative SNSES were associated with increased student reports of bullying, victimization, and others being bullied. Students in high SNSES schools reported less victimization at positive levels of school climate. There was little difference in student reported victimization

across different levels of school climate among students in low SENSE schools.

Implications for future research are discussed.

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## The impact of school neighborhood disadvantage on bullying: Examining the role of school climate

Bullying is a pervasive problem in U.S. schools. Anywhere from 40 to 80% of school-aged children report being victimized by peers at school. Of these, 10 to 30% report being victimized repeatedly (U.S. Commission on Civil Rights, 2011). Bullying is typically defined as, “exposure, repeatedly and over time, to negative or aggressive acts on the part of one or more other students” (Olweus, 2010, p. 11). The key features that distinguish bullying from a regular conflict between peers are the intent to cause harm, the repetition of aggression across time, and an imbalance of power between victim and perpetrator. Acts of bullying typically fall into one of two categories: overt or relational (Klomek et al., 2010). Overt, or direct victimization, refers to observable aggression by peers. This includes physical (e.g., hitting, pushing) and verbal aggression (e.g., name calling, threatening) (Hawker & Boulton, 2000). Relational, or indirect victimization, refers to aggression intended to harm relationships and social status (Hawker & Boulton, 2000). Examples of relational aggression include social exclusion, rumor spreading, and withholding friendship. Although relational aggression is typically viewed as covert, many acts such as ostracism are readily observable.

Victims of frequent bullying experience short- and long-term adjustment difficulties across different domains of social and psychological functioning, including lower self-esteem, higher levels of anxiety, depression, suicidal ideation, and withdrawn and avoidant behaviors (Hawker & Boulton, 2010; Klomek et al., 2010). Bullies also experience short- and long-term negative outcomes. Bullies tend to be more aggressive, hostile, and uncooperative (Fitzpatrick, Dulin & Piko, 2010). Some research indicates

that bullies are five times more likely than peers to end up in juvenile court, to be convicted of crimes, and become the parents of highly aggressive children (Meyer-Adams & Conner, 2008). Bullying also puts children at increased risk for school failure and depression (Graham, 2006).

### **Individual-Level Factors Related to Bullying**

Research indicates that certain individual characteristics heighten the risk of bullying and victimization. In general, studies indicate that boys are more likely than girls to be aggressors and victims (Swearer, Espelage, Vaillancourt, & Hymel, 2010).

However, most past bullying research has focused on overt acts of aggression, which boys tend to engage in more (Bauman, 2008). Some researchers argue that females are just as aggressive as males and the only difference between the two is that females are more likely to aggress and be victimized via relational means (Bauman, 2008). However, gender differences in relational aggression appear to vary with age. Research suggests that more girls below age 7 are victimized by relational means, but the gender difference disappears in children ages 8 to 12, and then becomes large again above age 12, with more girls experiencing relational aggression than boys (Bauman, 2008).

Although bullying affects children and youth of all ages, research suggests that bullying peaks during early adolescence. Specifically, bullying tends to increase somewhat during childhood, peak during early adolescence, and decline slightly during the late adolescent years (Nansel et al., 2001; Guerra, Williams, & Sadek, 2011). A similar age pattern has been found regarding victimization (Guerra et al., 2011).

In contrast to gender and age, ethnicity is a complex issue in the bullying literature. Some research indicates that Black and Latino children report less involvement

in bullying. For instance, Nansel et al. (2001) found that Black children, followed by Latino children, were less likely to report being bullied than White children. Other research indicates that Black and Latino children are more likely to be involved in bullying. Peskin, Tortolero, and Markham (2006) found that Black children were more likely to participate in bullying and be victims of bullying than Latino children. Additionally, with the exception of African-American children in their sample, Graham and Juvonen (2002) found that Latino children were more likely to be aggressors than White, Asian, and Middle Eastern children. Overall, research suggests that Black and Latino children are more likely to witness and be the victims of violence and crime than White children (Cooley-Strickland et al., 2009).

Other individual-level characteristics that have been identified as risk factors for bullying include externalizing behavior and normative beliefs supporting aggression (Cook et al., 2010, Guerra et al., 2011). Individual characteristics associated with increased victimization include not fitting in with peers, low social competence, obesity, and developmental disabilities (Cook et al., 2010; Swearer et al., 2010). Additionally, low self-esteem has been found to be a risk factor for both bullying and victimization (Guerra et al., 2011).

### **The Ecology of Bullying**

Most research has focused on individual level predictors. However, bullying is a phenomenon that occurs within a broader social context (Cook et al., 2010).

Consequently, researchers have begun to advocate for an ecological perspective of bullying to guide prevention and intervention efforts (e.g., Schwartz, Kelly, Duong, & Badaly, 2010; Swearer et al., 2010). As first articulated by Urie Bronfenbrenner in

ecological systems theory, children develop within a set of embedded contexts, each with the potential to independently, or in interaction with other contexts, influence the ways in which development occurs. Bronfenbrenner's most recent model (Bronfenbrenner, 1994) conceptualized ecological contexts as consisting of a number of nested levels with varying degrees of proximity to the child, including the micro-, meso-, exo-, macro-, and chronosystem. The microsystem refers to the immediate contexts in which the child lives, such as the family, school, and neighborhood settings. The mesosystem includes interactions between two or more microsystems. The exosystem refers to the policies, practices, and norms of the communities in which children and their families live. The macrosystem refers to the underlying mainstream societal beliefs and values. Finally, the chronosystem includes consistency or change (e.g., historical or life events) of the individual and the environment over the life course (e.g., changes in family structure) (Bronfenbrenner, 1994; Kuperminc, Wilkins, Roche, and Alvarez-Jimenez, 2009).

Recently, researchers have added ontogenetic development to the ecological model, which refers to the child and his or her own developmental adaptation (Belsky, 1993; Cicchetti & Toth, 1999). Moreover, it is hypothesized that all levels of the environment transact with each other over time in shaping child development (Cicchetti & Toth, 1999; Kuperminc et al., 2009). Aside from the home, schools and neighborhoods are the microsystems children spend the most time in (Gershoff & Aber, 2006). Consequently, these two contexts play an important role in child development and may affect the risk of being bullied.

### **School-Level Factors Related to Bullying**

Research indicates that bullying is more prevalent in high-conflict, disorganized schools than in low-conflict, harmonious schools (Williams & Guerra, 2007). Specifically, school factors such as overcrowding, a large school size, low levels of supervision, and disciplinary harshness are associated with higher rates of behavior problems and bullying (Bowes et al, 2009; Williams & Guerra, 2007). Some research also suggests that schools with a higher proportion of low-income students and a lower proportion of non-White students tend to have higher rates of violence and victimization (Gregory et al., 2010).

School climate is another important factor to consider when examining school bullying (Swearer et al., 2010). It refers to the psychological impact of the school environment on children and adults within the school (Hopson & Lee, 2011). An individual's experience of the school environment is shaped by the norms, goals, values, relationships, learning and teaching strategies, and organizational structure in the school (Cohen & Geier, 2010, p. 1). Altogether, these characteristics determine whether children and adults within a school feel safe, respected, valued, and supported (Hopson & Lee, 2011). Positive school climates are characterized by strong feelings of school safety, feeling cared for and respected by other members of the school community, a sense of belonging to the school community, and clear norms, goals, and values that promote learning (Cohen & Geier, 2010).

Positive school climate is associated with higher academic achievement, improved self-esteem, lower levels of substance abuse, and reduced mental health problems among students, as well as lower rates of aggression and violence (Cohen & Geier, 2010). Previous research also indicates that positive school climate is negatively

associated with bullying among students (Cohen & Geier, 2010; Swearer et al., 2010). For instance, in a sample of 7,583 middle school students, Meyer-Adams and Conner (2008) found that being a victim of bullying and being a bully were negatively associated with positive school climate. Positive school climate was also negatively associated with bringing a weapon to school for protection and avoidant responses to bullying, such as staying at home, cutting class, avoiding the locker room, and being afraid to report a student to the principal. Similarly, Guerra et al. (2011) found that increases in bullying and victimization during the course of a school year were associated with declines in self-esteem and increases in negative perceptions of school climate. Their sample consisted of 2,261 elementary through high school students. Additionally, a recent meta-analysis of 153 studies assessing individual and contextual factors related to bullying, Cook et al. (2010) found that negative school climate emerged as the strongest predictor of victimization followed by community factors (e.g., socioeconomic indicators, rates of violence or crime, and drug trafficking). School climate also emerged as a significant predictor of bullying.

### **Neighborhood-Level Factors Related to Bullying**

Neighborhood characteristics such as vandalism, conflicts with neighbors, and community violence exposure have been linked to bullying (e.g., Bacchini et al., 2009; Bowes et al., 2009). However, little research has focused on neighborhood disadvantage or poverty as a risk factor for bullying. When characterizing a neighborhood as disadvantaged, two factors that are generally considered are neighborhood context and neighborhood composition (Gershoff & Aber, 2006). Neighborhood context refers the availability of institutional and social resources thought to be necessary for an enhanced

quality of life, such as access to libraries, museums, parks, child care, quality schools, health care services, employment opportunities for youth, and adequate supply of and access to jobs for adults (Gershoff & Aber, 2006). Neighborhood composition refers to the percentage of low-income individuals and families living in a community.

Neighborhood context and composition are closely related and often difficult to tease apart. That is, disadvantaged neighborhoods are typically inhabited by low-income individuals and families, and neighborhoods containing a large percentage of low-income inhabitants are characterized by few community resources and limited opportunities (Gershoff & Aber, 2006).

Neighborhood disadvantage has been consistently linked with higher levels of child and adolescent externalizing behavior problems, including conduct disorder, delinquency, and drug use (Gershoff & Aber, 2006; Mrug & Windle, 2009). Although most research has been correlational, studies utilizing twin samples provide some evidence for a direct link between neighborhood disadvantage and child emotional and behavioral problems (Gershoff & Aber, 2006). For instance, in a study of 3,535 two-year-old twins, Caspi, Taylor, Moffitt, and Plomin (2000) found that children living in deprived neighborhoods were at increased risk for the development of behavioral problems (i.e., emotional, attention, and conduct problems) over and above genetic risk factors. Specifically, neighborhood deprivation explained 1% of the total variance in behavior problems (Caspi et al., 2000).

Further research indicating a direct association between neighborhood disadvantage and child externalizing problems comes from experimental studies, in which families are randomly assigned to move to more advantaged neighborhoods

(Gershoff & Aber, 2006). For example, in the Moving to Opportunity (MTO) project, which was sponsored by the U.S. Department of Housing and Urban Development, 2,000 families who were public housing residents in either Baltimore, Boston, Chicago, Los Angeles, or New York City were randomly assigned to one of three conditions: 1) conventional Section 8 housing vouchers for relocation within the city; 2) vouchers and assistance to move to low-poverty areas; and 3) remaining in public housing. Analyses of the Baltimore site data conducted by Ludwig, Duncan, & Hirschfield (1998; as cited by Leventhal & Brooks-Gunn, 2000) revealed that male youth who remained in high-poverty neighborhoods were more likely to be arrested for violent crimes than youth who moved to low-poverty neighborhoods.

Overall, previous research indicates that the effects of neighborhood disadvantage on child and adolescent externalizing behaviors are small to modest (Leventhal & Brooks-Gunn, 2000). Given that previous research indicates a link between neighborhood disadvantage and externalizing behavior problems in children, a neighborhood's SES may also be associated with children's involvement in bullying at school. In general, children who suffer from externalizing behavior problems are more likely to bully and be bullied by others (Cook et al., 2010).

### **Intersection between Neighborhood Disadvantage and Schools**

Most research examining the impact of neighborhood disadvantage on child outcomes has focused on the neighborhoods in which children reside. Little research has focused on the neighborhoods where children's schools are located and the impact these settings may have on child development. Research indicates that many children often spend their time in multiple neighborhoods and only studying children's residential



neighborhoods will not give a complete picture of the contexts in which they live (Gershoff & Aber, 2006). Bronfenbrenner's ecological systems theory holds that the structure of the surrounding community partially determines the functioning of the school and the nature of peer group interactions within the school (Schwartz et al., 2010). Schools in disadvantaged, disorganized communities have been found to have higher rates of violence and victimization (Limbos & Casteel, 2008). For instance, in a sample of 15,916 Jewish and Arab students in Israeli schools, Khoury-Kassabri, Benbenishty, Astor, and Zeira (2004) found that school neighborhood SES (SNSSES) was negatively associated with levels of victimization among students, including physical aggression and verbal threats. Similarly, Welsh, Greene, and Jenkins (1999) found that higher levels of school neighborhood poverty were related to higher levels of student misconduct in their sample of 7,583 middle school students. Additionally, schools in neighborhoods characterized by poor quality housing, high population density, and population turnover (proxies of neighborhood disadvantage) have higher student suspension rates than schools in other neighborhoods (Gershoff & Aber, 2006). Disadvantaged, disorganized communities may impair the ability of local institutions, such as schools, to transmit proper rules of behavior and to control the behavior of students by heightening exposure to risk going to and from school, through the importation of norms and behaviors conducive to the use of violence to resolve disputes, and by weakening effective community controls over the behavior of children who attend school in a specific neighborhood (Limbos & Casteel, 2008; Welsh et al., 1999).

### **School Climate as Moderator of School Neighborhood Effects**

According to ecological systems theory, at the level of the mesosystem two or more microsystems interact and influence each other, and in turn influence children's development. From a risk and resilience perspective protective processes in one microsystem may mitigate the negative effect of risk processes in another. Although school neighborhood disadvantage may have an impact on student behavior in school, school characteristics, such as, positive school climate, may buffer against the impact of school neighborhood disadvantage on student outcomes. Specifically, student perceptions of school climate are shaped by their relationships with others at school and a positive school climate is characterized by supportive relationships among students and school personnel (Hopson & Lee, 2011). Having supportive relationships with teachers and peers can serve as an important protective factor in the lives of at-risk youth (Luthar, 2006).

Some research indicates that a positive school climate can help improve child outcomes in the face of poverty (Hopson & Lee, 2011). For instance, Esposito (1999) found that parent perceptions of positive school climate were associated with higher school adjustment and social skills in a sample of 189 ethnic minority, pre-kindergarten through second-grade children living in poor urban neighborhoods. Similarly, in a study of 485 secondary school students, Hopson and Lee (2011) found that students from low-income families whose perceptions of school climate were negative were more likely to experience behavioral problems (i.e., truancy, missing homework, fights with other students, suspensions) than students from high income families who also rated their school climate negatively. In this study, there were no differences in behavioral outcomes

among low- and high-income students who rated their school climate positively (Hopson & Lee, 2011).

### **Current Study**

In sum, school factors, such as school climate, and school neighborhood factors, such as SENSES, may have an impact on bullying through the tone and norms they create for how people should treat one another. However, no study to date has examined how school climate and SENSES interact to influence bullying. In conducting such a study, individual and school characteristics, such as student grade level, gender, and ethnicity, school size, and the percentage of ethnic minority students in a school must be controlled for, as previous research indicates that these variables are associated with bullying and one major goal of the study is to isolate the effect of SENSES and school climate on bullying. Therefore, analyses examining the study hypotheses control for the effects of school size, the proportion of ethnic minority students, student gender, student ethnicity, and student grade level.

### **Study Hypotheses**

H1a: Lower SENSES and a more negative school climate will be associated with higher student reports of victimization.

H1b: Lower SENSES and a more negative school climate will be associated with higher student reports of bullying.

H1c: Lower SENSES and a more negative school climate will be associated with higher student perceptions of others being bullied at school.

H2a: School climate will moderate the association between SENSES and student reports of bullying.

H2b: School climate will moderate the association between SNSES and student reports of victimization.

H2c: School climate will moderate the association between SNSES and student perceptions of others being bullied at school.

## **Method**

### **Participants**

Data for this study were drawn from the electronic database of the Developing Safe and Civil Schools Initiative (DSACS). DSACS was a five-year, action-research project, designed to help schools coordinate existing Social Emotional Learning (SEL) efforts in character development, positive behavior, health promotion, and at-risk behavior prevention in order to build an integrated and coordinated SEL framework in schools. The study sample consists of 9,603 students from 26 public schools in New Jersey participating in DSACS in the 2007-2008 academic year. Of these, 49.7% were female and 50.1% self-identified as White, 15.7% as Latino, 12.3% as Mixed, 7.1% as Black, 6.5% as Asian, 2.7% as Middle Eastern and 5.4% as Other. Student grade levels ranged from 3 to 12, with 6.1% third-, 11% fourth-, 13.8% fifth-, 8.4% sixth-, 12.7% seventh-, 14.8% eighth-, 8.2% ninth-, 9.2% tenth-, 8.0% eleventh-, and 7.8% twelfth-graders. The sample of students who completed the survey consists of only those present during the day the assessment took place. There were no makeup opportunities and fewer than 1% of eligible students refused to participate in survey.

Of the 26 schools, 11 were elementary, 3 were elementary/middle schools, 8 were middle schools, and 4 were high schools. School enrollment ranged from 172 to 1,776 students with a mean of 680.62 ( $SD = 425.67$ ) students per school. The percentage of

students qualifying for free- and reduced-lunch varied from 0.76 to 77.83 ( $M = 16.86$ ,  $SD = 21.04$ ). The 26 schools were nested within 18 2000 U.S. Census tracts. Of the 26 schools, 34.6% were in the four lowest District Factor Groupings (DFG). DFG is an indicator of the SES of individuals living in each school district. This indicator consists of the following 1990 U.S. Census variables: percent of adult residents who failed to complete high school, percent of adult residents who attended college, occupational status of adult household members, persons per square mile, median family income, percent of those in the workforce who received some unemployment compensation, and percent of residents below the poverty level. DFG groupings range from A (lowest socioeconomic districts) to I (highest socioeconomic districts) (New Jersey Department of Education, 2011).

## **Measures**

**School-level risk factors.** Past research indicates that school size and composition can have an impact on bullying (Bowes et al., 2009; Gregory et al., 2010). Consequently, the current study controlled for school size based on student enrollment and the percentage of ethnic minority students. Percentage of ethnic minority students was defined as the percentage of non-White students in a school.

**Individual-level risk factors.** Previous research also indicates that boys are more likely than girls to be victims and perpetrators. Secondary school students are also more likely to be involved in bullying than elementary school students (Bauman, 2008). Additionally, ethnic minority students, such as African-American and Latino, are more likely to be exposed to violence than White students (Cooley-Strickland et al., 2009). Therefore, all analyses took student gender, grade level, and ethnicity into account.

**Demographics.** Students answered a series of questions asking them to indicate their gender, ethnicity, and grade level (Appendix).

**Climate survey.** Students completed the DSACS Climate Survey-Student version (DSACS-CS-Stu; Elias, 2009), which consists of 14 questions examining various aspects of school climate, including the level of respect among students (e.g., “Students treat classmates with respect”), feelings of friendship and belonging (e.g., “Students work well together”), students’ ability to shape the school environment (“Students are involved in helping to solve school problems”), and support from teachers (e.g., “Teachers go out of their way to help students who need extra help”). These questions were adapted from the School as A Caring Community Profile-II (SCCP-II; Lickona & Davidson, 2003).

Students were instructed to indicate the extent to which they agreed with each survey item using a 5-point likert scale (1= Disagree, 2 = Slightly Disagree, 3 = Neither Agree Nor Disagree, 4 = Slightly Agree, 5 = Agree). A total climate score was computed for each participant by summing the fourteen items, with higher scores indicating a more positive school climate. Cronbach’s alpha for the fourteen item DSACS-SC-Stu was .85.

**Bullying.** A series of bullying items were listed after the climate survey items and these were used to measure three constructs. *Victimization* was assessed via the item, “I am bullied or teased by classmates at school.” The item, “I never bully or tease anyone while at school” was used to examine *bullying* (perpetration). Scores for this item were reverse coded. *Overall perceptions of others being bullied* at school was measured using three items, (e.g., “Students are often bullied or teased in my school.”, “Students pick on other students,” and “Students exclude those who are different”). Cronbach’s alpha for these three items was .61. A total score for perceptions of others being bullied was

computed for each participant by summing the three items. For all items, students were instructed to indicate the extent to which they agreed with each using a 5-point likert scale (1= Disagree, 2 = Slightly Disagree, 3 = Neither Agree Nor Disagree, 4 = Slightly Agree, 5 = Agree).

**School neighborhood socioeconomic status.** Each school address was geocoded to yield a census tract based on the 2000 U.S. Census. For each census tract, the following information was extracted to create an index of neighborhood disadvantage: percent of adults unemployed, percent of unemployed males, percent of people in poverty, percent of households receiving public assistance, percent female-headed households, and percent of renter-occupied households. These variables were converted to  $z$ -scores and averaged for a composite measure SNSSES (Katz et al., 2011; Leventhal & Brooks-Gunn, 2000). These scores were then reverse coded to make results more interpretable, with lower scores equaling more poverty.

### **Procedure**

All schools involved in this study participated in DSACS. As a condition of participation, schools were encouraged to complete the school climate and bullying assessment during the fall of their first year in the program and in the fall of each subsequent school year. The data used in this study consists of the first available climate assessment for schools participating in the third year of DSACS (i.e., 2007-2008), when the climate survey format was stabilized. Schools were given the option to either complete a paper version of the survey or an online version. After deciding which version to complete, the designated school coordinator was instructed in the assessment procedures by trained DSACS personnel. Surveys were completed anonymously by

students. All procedures were approved by the Institutional Review Board of Rutgers University.

### **Data Analysis**

In this study, students were conceptualized as being nested within schools and neighborhoods. Therefore, multilevel linear modeling (MLM) was used to examine the study hypotheses. HLM 7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011) was used to complete all the MLM analyses. Before conducting analyses addressing the questions of interest, checks were made for missing and out-of-range data. All continuous predictor variables were centered to reduce multicollinearity. A series of two-level MLM models were examined for each of the three Level 1 outcome variables: 1) student-reported victimization, 2) student-reported bullying perpetration, and 3) student perceptions of others being bullied at school. Originally, the plan for the study involved computing a series of three-level models with students nested within schools nested within neighborhoods. However, the small number of census tracts and schools within each tract limited the statistical power to find significant results with a three-level model.

In the MLM models that were computed for each outcome variable, student gender, grade, and ethnicity were entered as Level 1 predictors. To analyze the effects of gender, grade and ethnicity, these variables were dummy coded with females, seventh grade, and White students as the reference groups. For student ethnicity, students who self-identified as Mixed, Other, and Middle Eastern were grouped into the category Other for the MLM analyses. School and neighborhood factors were treated as Level 2 variables. Specifically, SNSSES, mean school climate, the interaction between SNSSES and



mean school climate, school size, and percentage of ethnic minority students were entered as Level 2 predictors.

To test the study hypotheses, three models were examined for each dependent variable. The first model was a two-level model with no predictors. The second model included only Level 1 control variables (i.e., student gender, grade level, and ethnicity). The third model included all the Level 1 and Level 2 control variables (i.e., school size and percentage of ethnic minorities), plus SENSES, mean school climate, and the interaction between SENSES and mean school climate at Level 2. The deviances of the models were compared to determine the best fitting model (Hox, 2002).

## **Results**

Results are presented in four sections. First, missing data analyses are reported. Second, descriptive analyses are presented, including a exploratory factor analysis examining whether school climate should be represented by one total score. Third, HLM analyses testing the hypotheses that lower SENSES and negative school climate are associated with higher levels of student reported bullying, victimization, and perceptions of others being bullied at school are presented. Additionally, HLM analyses examining whether school climate moderated the association between SENSES and student reported bullying, victimization, and perceptions of others being bullied are also included.

### **Missing Data**

Of the 9,603 students, 934 did not report their grade, 57 did not report their ethnicity, and 48 did not report their gender. These cases with missing data were excluded from study analyses. Students who did not report their grade were significantly more likely to report bullying others than students who reported their grade,  $t(1133.85) =$

4.12,  $p < .01$ . A chi-square test for independence also revealed that there was a significant difference between students missing grade data and those with grade data on ethnicity. Specifically, students who reported their grade were more likely to be White than those who did not report their grade (52% versus 35.1%),  $\chi^2 (4, n = 9,565) = 160.43, p < .01$ . Students who did not report their ethnicity were more likely to report being victims than those who did report their ethnicity  $t(9601) = 2.23, p = .026$ . Finally, students who did not report their gender were less likely to report bullying others than those who did report their gender,  $t(9601) = 4.96, p < .01$ . There was no missing data for any of the school-level variables.

### **Descriptives**

Descriptive statistics for all study variables are presented in Table 1. Of the 9,603 students in the sample, 20.2% reported bullying others (i.e., responded either agree or strongly agree) and 24.9% of students reported being victimized. The mean perception of others being bullied at school score, 3.22, indicates that students also perceived a moderate amount of bullying in their school.

The mean school climate score, 3.40, indicated that overall students had slightly positive perceptions of their school's climate. The range of SNSSES scores (-1.68 to 0.71) indicated that school neighborhoods varied widely in terms of SES. There was a strong negative correlation between the SNSSES and free and reduced lunch status ( $r = -.86, p < .01$ ).

### **Exploratory Factor Analysis**

The 14 items of the school climate scale, the DSACS-CS-Stu, were subjected to principal components analysis in order to determine whether climate should be

represented by one scale. Results revealed the presence of two components with eigenvalues exceeding 1, explaining 33.35% and 9.15% of the variance respectively. An inspection of the scree plot revealed a break after the first component. Using Cattell's scree test (Pallant, 2007) it was decided to retain one component for further investigation. To aid in the interpretation of this component, oblimin rotation was performed. The rotated solution revealed the presence of simple structure (Pallant, 2007), with all variables loading substantially on only one component. The results of this analysis support the use of the DSACS-CS-Stu as one scale. As noted above, the items of the DSACS-CS-Stu had good internal consistency (Cronbach's alpha = .85).

### **Correlations**

Table 2 presents Pearson product-moment correlations among the student level predictor and outcome variables. For these analyses, student ethnicity was dichotomized into White and non-White students (coded zero for White and one for non-White). Older students, males, and non-White students were more likely to report bullying others ( $p < .01$ , respectively). Younger students were less likely to report being victimized and males were more likely to report being victimized than females ( $p < .01$ , respectively). Older and non-White students were more likely to perceive others being bullied and girls were more likely to perceive others being bullied ( $p < .01$  and  $p = < .05$  respectively). Correlations were also conducted among the school-level predictors (see Table 3). Positive school climate was associated with a smaller school size ( $p < .01$ ). Higher SENSES was associated with a lower percentage of ethnic minority students in each school ( $p < .05$ ).

### **HLM Analyses**

HLM models using Full Maximum Likelihood (FML) estimation were examined for each of the three Level 1 outcome variables: 1) student-reported bullying, 2) student-reported victimization, and 3) student perceptions of others being bullied at school. Three models were examined for each outcome. The first model was the two-level HLM model with no predictors (unconditional model). The intraclass correlation coefficient (*ICC*), which is the proportion of between-school variance to the total variance, was calculated from the unconditional model. The second model included only Level 1 variables, which were entered as fixed effects. The Level 1 variables were gender, ethnicity, and grade level. The third model included the Level 1 variables and all the Level 2 variables. The Level 2 variables included school size, percentage of ethnic minority students in each school, SENSES, mean school climate, and the interaction between SENSES and mean school climate. For student-reported bullying, Model 3 was as follows:

$$\begin{aligned} \text{Level 1 model: } Y_{ij} = & \beta_{0j} + \beta_{1j}(\text{Black}_{ij}) + \beta_{2j}(\text{Latino}_{ij}) + \beta_{3j}(\text{Asian}_{ij}) + \beta_{4j}(\text{Other}_{ij}) \\ & + \beta_{5j}(\text{Third}_{ij}) + \beta_{6j}(\text{Fourth}_{ij}) + \beta_{7j}(\text{Fifth}_{ij}) + \beta_{8j}(\text{Sixth}_{ij}) + \beta_{9j}(\text{Eighth}_{ij}) + \beta_{10j} \\ & (\text{Ninth}_{ij}) + \beta_{11j}(\text{Tenth}_{ij}) + \beta_{12j}(\text{Eleventh}_{ij}) + \beta_{13j}(\text{Twelfth}_{ij}) + \beta_{14j}(\text{Female}_{ij}) + r_{ij} \end{aligned}$$

$$\begin{aligned} \text{Level 2 model: } \beta_{0j} = & \gamma_{00} + \gamma_{01}(\text{SENSES}_j) + \gamma_{02}(\% \text{ Ethnic Minority}_j) + \gamma_{03}(\text{School} \\ & \text{Size}_j) + \gamma_{04}(\text{Mean School Climate}_j) + \gamma_{05}(\text{SENSES} \times \text{Mean School Climate}_j) + u_{0j} \end{aligned}$$

In the equation above, *i* refers to the individual level, *j* refers to the school level, *e* refers to error at the individual level, and *u* refers to error at the school level. Student gender, ethnicity and grade were dummy coded with females, White, and seventh grade as the reference groups.

**Bullying.** Table 4 presents the summary of HLM analyses for student-reported perpetration of bullying. The between-school variance in bullying accounted for 6.22% of

the total variance ( $ICC = .0622$ ). In Model 2, Black, Latino, and Other students were significantly more likely to report bullying others than White students. Third-, fourth-, fifth-, and sixth-grade students were significantly less likely to report bullying others than seventh-grade students. Additionally, girls were less likely to report bullying than boys. In Model 3, school size and percentage of ethnic minorities in each school did not emerge as significant predictors of bullying. However, SENSES and mean school climate emerged as significant predictors. Lower SENSES was associated with higher self-reports of bullying. Similarly, more negative levels of school climate were associated with higher self-reports of bullying. The interaction between SENSES and mean school climate did not emerge as a significant predictor of bullying.

To test whether the final model was significantly better than the null and Level 1 models, the deviances of the models were compared. The deviance of two models can be compared for statistical fit if they are nested (i.e., a specific model can be derived from a more general model by removing parameters from that general model). For nested models, the difference in deviance has approximately a chi-square distribution, with the number of degrees of freedom being equal to the difference in the number of parameters of the two models (Hox, 2002). This difference in deviance can be used to perform a formal chi-square test, in order to test whether the more general model fits significantly better than the simpler model. In general, models with a lower deviance fit better than models with higher deviance (Hox, 2002). The deviance of the Level 1 model for bullying is reported in Table 4 and shows a statistically significant improvement in fit compared with the null model ( $\chi^2 = 3737.53$ ,  $df = 14$ ,  $p < .01$ ). Table 4 also shows that for bullying, the Level 2 model with the school-level variables fit the data better than the

Level 1 model did ( $\chi^2 = 20.54$ ,  $df = 8$ ,  $p < 0.01$ ). Table 4 also includes the Akaike Information Criterion (AIC), which is another index of model fit. The best fitting model is the model with the lowest AIC (Hox, 2002). The final model with the school-level effects shows the lowest AIC.

**Victimization.** Table 5 presents the summary of the HLM analyses for student reported victimization. The between-school variance in victimization accounted for 1.51% of the total variance ( $ICC = .0151$ ). In Model 2, only gender emerged as a significant predictor, with girls being less likely to report being victimized than boys. In Model 3, school size and percentage of ethnic minorities in each school did not emerge as significant predictors of victimization. As with bullying, SNSSES and mean school climate emerged as significant predictors of victimization. Lower SNSSES was associated with higher self-reports of victimization. Similarly, negative levels of school climate were associated with higher self-reports of victimization. The interaction between SNSSES and mean school climate also emerged as a significant predictor. The interaction was plotted according to the procedures outlined by Aiken and West (1991). As demonstrated in Figure 1, students in high SNSSES schools reported less victimization as school climate became more positive. There was little difference in student reported victimization across different levels of school climate among students in low SNSSES schools. The deviances for all three models are also reported in Table 5. The deviance of the Level 1 model indicates a statistically significant improvement in fit compared with the null model ( $\chi^2 = 3530.76$ ,  $df = 14$ ,  $p < .01$ ). Table 5 also shows that for victimization, the Level 2 model fit the data better than the Level 1 model did ( $\chi^2 = 31.17$ ,  $df = 8$ ,  $p < 0.01$ ). The final model with the school-level effects also shows the lowest AIC.

*Perceptions of others being bullied.* Table 6 presents the summary of the HLM analyses for student perceptions of others being bullied at school. The between-school variance in perceptions of bullying accounted for 14.57% of the total variance ( $ICC = .1457$ ). In Model 2, Black students were more likely than White students to perceive bullying in their school. Third-, fourth-, and fifth-grade students were less likely than seventh-graders to perceive others being bullied at school. In Model 3, school size and percentage of ethnic minorities in each school did not emerge as significant predictors of perceptions of others being bullied. However, SNSSES and mean school climate emerged as significant predictors. Lower SNSSES was associated with higher student perceptions of others being bullied. Similarly, lower levels of school climate were associated with higher student perceptions of others being bullied. The interaction between SNSSES and mean school climate was not significant.

Table 6 also presents the deviances for all three models. The deviance of the Level 1 model indicates a statistically significant improvement in fit compared with the null model ( $\chi^2 = 2902.88$ ,  $df = 14$ ,  $p < .01$ ). Table 6 also shows that for student perceptions of others being bullied, the Level 2 model fit the data better than the Level 1 model did ( $\chi^2 = 23.90$ ,  $df = 8$ ,  $p < 0.01$ ). The final model with the school-level effects also shows the lowest AIC.

## **Discussion**

This study sought to examine bullying in schools from an ecological systems perspective by assessing the role that important aspects of the school and neighborhood microsystems play in shaping student behavior and experiences. Specifically, this study examined whether SNSSES and school climate were associated with student reports of

bullying, victimization, and others being bullied at school. Evaluating the transaction between the school and neighborhood microsystems was of particular interest and to this end the interaction between SNSSES and school climate was assessed. Results revealed that school climate and SNSSES were directly associated with student reports of bullying, victimization, and perceptions of others being bullied. A significant interaction between school climate and SNSSES was also found for student reports of victimization.

### **School Climate**

As predicted, positive school climate was negatively associated with student reports of bullying, victimization, and perceptions of others being bullied. This association was present after controlling for student gender, ethnicity, and grade level, school size, proportion of ethnic minority students, and SNSSES, which are variables that have been found to be associated with bullying and victimization. These results are in line with previous research that indicates that schools with positive climates have lower rates of bullying and victimization (e.g., Guerra et al., 2011; Meyer-Adams & Conner, 2008). In this study, positive school climate was defined in terms of individual perceptions that school was a good place to be—where students respect each other, feel like they belong to a greater school community, feel they are allowed to take part in shaping the school environment, and feel supported by their teachers. Students who perceive their schools as friendly and fair places may be more likely to play by the rules and expect others to follow suit, leading to lower rates of bullying and victimization.

### **School Neighborhood Disadvantage**

Consistent with study hypotheses, lower SNSSES was related to increased student reports of bullying, victimization, and perceptions of others being bullied. Previous



research suggests a link between neighborhood SES and externalizing behavior problems in children (e.g., Khoury-Kassabri et al., 2004; Welsh et al., 1999). However, to the author's knowledge no existing research has examined the relation between SNSSES and bullying in schools. According to collective efficacy theory neighborhood disadvantage results in a diminished sense of mutual trust among neighbors and any willingness to intervene and exercise social control (Sampson, Raudenbush, & Earls, 1997). Low levels of trust and informal social control can result in a failure to monitor and enforce proper behavior among community members, including the behavior of adolescent groups, which in turn leads to higher levels of deviance and crime in the community (Mrug & Windle, 2009; Sampson et al., 1997). Lower neighborhood SES may lead to higher levels of bullying and victimization in schools through the introduction of norms consistent with low levels of collective efficacy, which may advocate the use of violence and aggression to resolve conflicts and having little regard for fairness or following rules.

### **The Moderating Effect of School Climate**

Controlling for SNSSES, students reporting more positive school climate reported less victimization. However, the effect of school climate was stronger for students in schools in higher SES neighborhoods. There was little difference in reports of victimization across levels of school climate for students in lower SES neighborhoods. Therefore, the significant interaction between SNSSES and school climate did not support the proposition derived from the risk and resilience perspective, as positive school climate only seemed to mitigate the negative effect of SNSSES on student behavior in high SNSSES schools. Overall, students in lower SES neighborhood schools reported higher levels of victimization than students in higher SES neighborhood schools. These results

are similar to the findings of Hopson and Lee (2011) who found that students from low-income families whose perceptions of school climate were negative were more likely to experience behavioral problems than students from high income families who also rated their school climate negatively.

The current study findings suggest that for schools located in impoverished neighborhoods, improving school climate alone may not mitigate the adverse effects of low SENSES on victimization among students. Schools in impoverished neighborhoods may need to implement specific intervention programs designed to target bullying. However, it should be noted that any school-based bullying intervention program should be comprehensive and take a multilevel approach, which includes building a more positive school climate. Comprehensive efforts should incorporate programming that all children receive regardless of their involvement in bullying (primary), more intensive prevention efforts for those at risk for greater involvement (secondary), and the most intensive efforts for those youth already highly involved (tertiary) (Biggs & Vernberg, 2010). At the primary or universal level, schools may adopt school-wide policies and rules to promote respectful social relationships that apply to all students and staff. Secondary level programming may include school-based skill building groups for children who experience difficulty building positive peer relationships. At the tertiary level, individual interventions designed to help children address emotional and behavioral problem that may interfere with social relationships, such as anxiety or depression can be provided (Biggs & Vernberg, 2010).

### **Characteristics of Students and Schools**

Consistent with previous research, girls were less likely to report bullying and victimization than boys (e.g., Swearer et al., 2010). It should be noted that this study asked students to report on bullying generally and specific types of peer victimization, such as relational aggression, were not assessed. Black, Latino, and students who self-identified as Other were more likely to endorse bullying others than White students. These results mirror the findings of previous research (e.g., Graham & Juvonen, 2002). No differences in victimization between ethnic minority students and White students emerged. Black students were also more likely to perceive others being bullied at school than White students which is contrary to previous research that indicates that Black students are less likely to report bullying and victimization overall (e.g., Nansel et al., 2001). It should be noted that the implications of a student's ethnicity may depend on the ethnic composition of a school as a whole (Schwartz et al., 2010). As noted above, bullying is most likely to occur when there is an imbalance of power between victims and perpetrators. A school's ethnic composition can "signal an imbalance of power and therefore function as a context for peer victimization" (Graham & Juvonen, 2002, p. 175). More specifically, in schools where the student body is made up of two or more ethnic groups, students in the statistical minority group (i.e., less powerful numerically) may be more likely to be victimized. Students in the statistical majority group (i.e., more powerful numerically), on the other hand, may be more likely to be aggressors (Graham, 2006; Graham & Juvonen, 2002).

Third-, fourth-, fifth-, and sixth-grade students were significantly less likely to endorse bullying others than seventh-grade students and third-, fourth-, and fifth-grade students were less likely than seventh-graders to perceive others being bullied at school.

These findings are consistent with previous research which indicates that bullying peaks during early adolescence (e.g., Nansel et al., 200; Guerra, et al., 2011).

School size did not emerge as a significant predictor of bullying and victimization. Researchers have long hypothesized that bullying is more likely to occur in larger schools as large school size has been linked to the development of aggressive behavior problems (Schwartz et al., 2009). However, our results mirror those of Khoury-Kassabri et al. (2004) who found that bullying and victimization are equally common in large and small schools. In this study, there was a negative correlation between school size and climate, with larger schools having a more negative climate. It is possible that the relationship between school size and bullying found in previous research is mediated by school climate. The proportion of ethnic minorities in a school also did not emerge as a significant factor.

### **Strengths and Limitations**

Strengths of the current study include the use of a multilevel design and avoidance of “ecological fallacy” whereby researchers ascribe group characteristics to individuals, as well as controlling for various student and school level variables. However, this study has several limitations that need to be acknowledged. Bullying and victimization were measured via single items and student perceptions of others being bullied was measured via three items. A definition of bullying was not provided and questions did not include other types of bullying, such as relational or cyberbullying. Results are therefore limited to student interpretations of bullying. Also, except for neighborhood SES, school size, and percentage of ethnic minorities in the school, all measures are based on student report and therefore have a shared method variance.

No measure of individual student family income was available. Given the relation between family SES and child aggression, it is important to control for family SES when considering the link between neighborhood disadvantage and child externalizing behavior problems (Leventhal & Brooks-Gunn 2000). It is difficult to determine how students' reports of bullying and victimization in their school are affected by the proportion of low SES families connected to the school and the SES of the neighborhood in which the school is located.

Data on the home neighborhoods of students were also not available. This study sought out to capture the effect of school neighborhood on child behavior. However, many children in NJ attend their neighborhood or zoned school. Without specific information on participants' home neighborhoods it is difficult to determine the proportion of children who attended schools in their home neighborhoods. One is left to assume that most children attended school in their home neighborhood. Therefore, this study was not able to fully capture the unique effect of school neighborhood. Additionally, the small sample of school neighborhoods and the small number of schools within each neighborhood prevented the use of a three-level model. The current study conceptualized students nested within schools and school neighborhoods. However, a three-level model with students nested within schools nested within neighborhoods would provide a more accurate representation.

### **Implications for Research, Policy and Practice**

Bullying is phenomenon that is of serious concern for students, parents, teachers, and school officials. While researchers have done much to advance our knowledge of bullying and victimization among children and adolescents, most research has focused on

individual level factors that influence the risk of bullying. Given the complexity of how individual characteristics, such as aggression, are largely influenced by the social contextual environments children and adolescents are exposed to, more research is needed that examines bullying from an ecological systems perspective (Hong & Espelage, 2012).

School climate emerged as an important contextual factor that is associated with bullying, victimization, and perceptions of others being bullied at school. Future research should consider the mechanisms by which school climate influences bullying and victimization. As Guerra et al. (2011) note, a positive school climate may prevent bullying by providing resources for positive youth development and encouraging youth to follow rules and treat each other with respect, while also providing an environment where victims feel they can stand up for themselves and report bullying.

To date, most school-based bullying intervention programs have focused on improving school climate and creating a school environment where students are informed about bullying, are aware of the consequences for bullying others, and the importance of being an effective defender or bystander for targeted peers. Unfortunately, many of these programs have had limited success in reducing bullying and have not considered other relevant ecological levels that may impact school climate such as neighborhood, cultural norms and beliefs, and religion (Hong & Espelage, 2012). As the results of this study indicate, SNSSES can have an impact on student behavior, as well as the association between school climate and victimization. To improve the effectiveness of school-based interventions aiming to improve school climate, the potential impact of other ecological levels on student behavior should be considered.

Overall, students in schools in lower SES neighborhoods were more likely to report bullying others, to be victimized, and perceive others being bullied at school. Future research should consider whether neighborhood factors, such as collective efficacy play a role in the association between low SENSES, school climate, and bullying in schools. Future research should also consider the nesting of schools within neighborhoods using MLM modeling.

Table 1  
*Means, Standard Deviations, and Ranges for Main Student and School Level Variables*

<i>Variable</i>	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Bullying	9603	2.27	1.32	1.00	5.00
Victimization	9603	2.34	1.41	1.00	5.00
Perceptions of Bullying	9603	3.22	0.97	1.00	5.00
School Size	26	680.62	425.66	172.00	1776.00
Percentage of Ethnic Minorities	26	31.98	29.83	5.46	98.26
School Climate	26	3.40	0.40	2.83	4.16
School Neighborhood SES	26	0.00	0.63	-1.68	0.71



Table 2  
*Intercorrelations Among Main Student Level Variables*

<i>Variable</i>	1	2	3	4	5	6
1. Bullying	--					
2. Victimization	.179**	--				
3. Perceptions of Others Being Bullied	.163**	.273**	--			
4. Grade	.118**	-.069**	.211**	--		
5. Gender	.121**	.043**	-.024*	-.005	--	
6. Ethnicity	.086**	.010	.027**	-.073**	.020	--

Note: \* $p < .05$ , \*\*  $p < .01$ .

Table 3  
*Intercorrelations Among Main School Level Variables*

Variable	1	2	3	4
1. Percent Ethnic Minority	--			
2. School Size	.030	--		
3. School Climate	.059	-.626**	--	
4. School Neighborhood SES	-.404*	-.267	.022	--

Note: \* $p < .05$ , \*\*  $p < .01$ .

Table 4  
*HLM Analysis with Student-Reported Bullying as Level 1 Outcome*

Measure	Model 1		Model 2		Model 3	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept $\beta_0$	2.14	0.07	2.51	0.07	2.45	0.06
Student-level predictors						
Black $\beta_{1j}$			0.40**	0.09	0.37**	0.06
Latino $\beta_{2j}$			0.15*	0.07	0.12*	0.05
Asian $\beta_{3j}$			-0.03	0.04	-0.04	0.06
Other $\beta_{4j}$			0.13**	0.03	0.12**	0.04
Third $\beta_{5j}$			-0.61**	0.11	-0.47**	0.09
Fourth $\beta_{6j}$			-0.57**	0.10	-0.42**	0.08
Fifth $\beta_{7j}$			-0.45**	0.13	-0.32**	0.08
Sixth $\beta_{8j}$			-0.17*	0.09	-0.16*	0.07
Eighth $\beta_{9j}$			-0.06	0.08	-0.06	0.05
Ninth $\beta_{10j}$			-0.12	0.08	-0.13	0.11
Tenth $\beta_{11j}$			-0.04	0.09	-0.45	0.11
Eleventh $\beta_{12j}$			-0.03	0.08	-0.04	0.11
Twelfth $\beta_{13j}$			-0.06	0.09	-0.06	0.11
Female $\beta_{14j}$			-0.33**	0.04	-0.33**	0.03
School-level predictors						
School Neighborhood SES $\gamma_{01}$					-0.18**	0.05
Percent Ethnic Minority $\gamma_{02}$					0.00	0.00
School Size $\gamma_{03}$					0.00	0.00
Mean School Climate $\gamma_{04}$					-0.43**	0.11
School Neighborhood SES x					-0.04	0.11
School						
Climate $\gamma_{05}$						
Random effects						
Individual level variance $\sigma^2$	1.67**	.024	1.61**	0.02	1.61**	0.25
School level variance $\tau$	.111**	.033	0.03**	0.01	0.01**	0.00
Deviance	32249.39		28511.86		28491.33	
Deviance Difference			3737.53***		20.53***	
AIC	32255.39		28545.86		28535.33	

Note: \* $p < .05$ , \*\*  $p < .01$ , \*\*\* $p < .001$ . AIC = Akaike Information Criterion.

Table 5  
*HLM Analysis with Student-Reported Victimization as Level 1 Outcome*

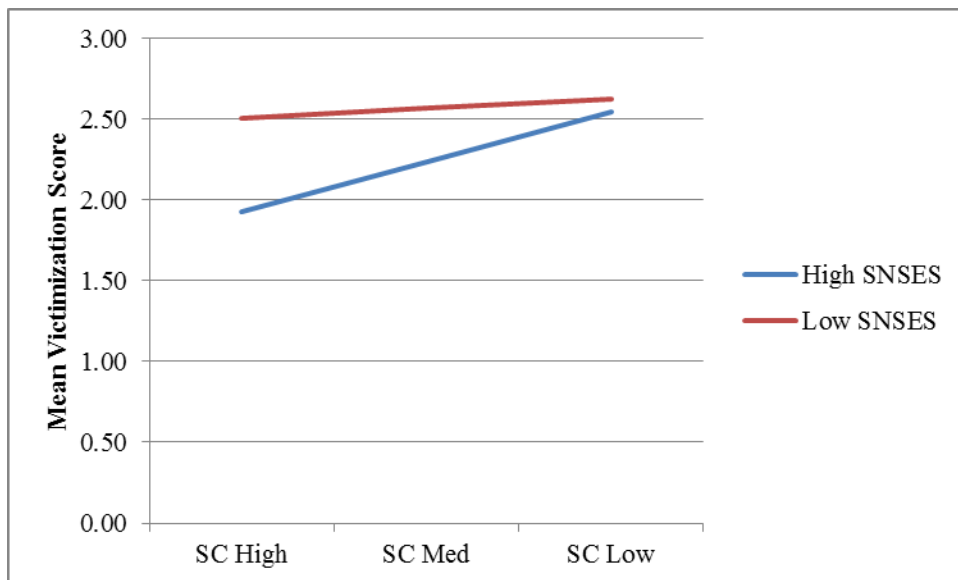
Measure	Model 1		Model 2		Model 3	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept $\beta_0$	2.40	0.04	2.41	0.07	2.34	0.06
Student-level predictors						
Black $\beta_{1j}$			-0.06	0.07	-0.07	0.07
Latino $\beta_{2j}$			-0.04	0.06	-0.06	0.06
Asian $\beta_{3j}$			0.10	0.06	0.09	0.06
Other $\beta_{4j}$			0.05	0.04	0.04	0.04
Third $\beta_{5j}$			0.03	0.10	0.19	0.10
Fourth $\beta_{6j}$			0.16	0.09	0.31**	0.09
Fifth $\beta_{7j}$			0.13	0.08	0.26**	0.08
Sixth $\beta_{8j}$			0.06	0.08	0.09	0.08
Eighth $\beta_{9j}$			-0.11	0.06	-0.11	0.06
Ninth $\beta_{10j}$			-0.09	0.13	-0.03	0.11
Tenth $\beta_{11j}$			-0.03	0.13	0.02	0.11
Eleventh $\beta_{12j}$			-0.18	0.13	-0.12	0.11
Twelfth $\beta_{13j}$			-0.22	0.13	-0.17	0.11
Female $\beta_{14j}$			-0.12**	0.03	-0.12**	0.03
School-level predictors						
School Neighborhood SES $\gamma_{01}$					-0.14*	0.05
Percent Ethnic Minority $\gamma_{02}$					0.00	0.00
School Size $\gamma_{03}$					-0.00	0.00
Mean School Climate $\gamma_{04}$					-0.58**	0.12
School Neighborhood SES x					-0.26*	0.12
School						
Climate $\gamma_{05}$						
Random effects						
Individual level variance $\sigma^2$	1.94**	0.03	1.95**	0.03	1.95**	0.03
School level variance $\tau$	0.030**	0.01	0.04**	0.01	0.01**	0.00
Deviance	33661.87		30131.11		30099.94	
Deviance Difference			3530.76**		31.17**	
AIC	33667.87		30165.11		30143.94	

Note: \* $p < .05$ , \*\*  $p < .01$ , \*\*\* $p < .001$ . AIC = Akaike Information Criterion.

Table 6  
*HLM Analysis with Student-Reported Perceptions of Others Being Bullied as Level 1 Outcome*

Measure	Model 1		Model 2		Model 3	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept $\beta_0$	3.04	0.08	3.25	0.07	3.26	0.05
Student-level predictors						
Black $\beta_{1j}$			0.10*	0.05	0.10*	0.05
Latino $\beta_{2j}$			-0.06	0.04	-0.06	0.04
Asian $\beta_{3j}$			-0.01	0.04	-0.01	0.04
Other $\beta_{4j}$			-0.00	0.03	-0.01	0.03
Third $\beta_{5j}$			-0.77**	0.07	-0.69**	0.07
Fourth $\beta_{6j}$			-0.47**	0.06	-0.40**	0.06
Fifth $\beta_{7j}$			-0.27**	0.06	-0.21**	0.06
Sixth $\beta_{8j}$			-0.05	0.05	-0.04	0.05
Eighth $\beta_{9j}$			-0.03	0.04	-0.03	0.04
Ninth $\beta_{10j}$			0.05	0.15	-0.25	0.14
Tenth $\beta_{11j}$			0.11	0.15	-0.19	0.14
Eleventh $\beta_{12j}$			0.07	0.15	-0.23	0.14
Twelfth $\beta_{13j}$			0.01	0.15	-0.29*	0.14
Female $\beta_{14j}$			0.03	0.02	0.03	0.02
School-level predictors						
School Neighborhood SES $\gamma_{01}$					-0.11*	0.07
Percent Ethnic Minority $\gamma_{02}$					0.00	0.00
School Size $\gamma_{03}$					0.00	0.00
Mean School Climate $\gamma_{04}$					-0.59**	0.13
School Neighborhood SES x					-0.15	0.14
School						
Climate $\gamma_{05}$						
Random effects						
Individual level variance $\sigma^2$	.852**	.012	0.83**	0.01	0.84**	0.01
School level variance $\tau$	.145**	.042	0.06**	0.02	0.03**	0.01
Deviance	25816.91		22914.03		22890.13	
Deviance Difference			2902.88**		23.90**	
AIC	25822.91		22948.03		22934.13	

Note: \* $p < .05$ , \*\*  $p < .01$ , \*\*\* $p < .001$ . AIC = Akaike Information Criterion.



Note: SC = Mean school climate; SNSES = School neighborhood disadvantage.

*Figure 1.* Plot of the interaction between SNSES and mean school climate predicting self-reported victimization

## Appendix

## Demographic Questions

1. What grade were you in when you STARTED attending this school?
  - a) Kindergarten-1st-2nd
  - b) 3rd
  - c) 4th
  - d) 5th
  - e) 6th, 7th, 8th
2. What is your gender?
  - a) Female
  - b) Male
3. Which of the following describes your ethnicity/race? Please select all that apply.
  - a) Black/ African-American/Caribbean/West Indies
  - b) European-American/Caucasian
  - c) Middle-Eastern American
  - d) American Indian or Alaska Native
  - e) None of these
4. Which of the following describes your ethnicity/race? Please select all that apply.
  - a) Latino/Latina/Hispanic-American
  - b) Chinese/Japanese/Korean American
  - c) Indian/Pakistani American
  - d) Vietnamese/Thai/Malaysian/Southeast Asian/Other Asian American
  - e) None of these

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## Curriculum Vita

**Jazmin Reyes-Portillo****Education**

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- 06/12 – 06/13      **Columbia University Medical Center**  
New York, NY  
*Internship, June 2013*
- 09/08 – 06/13      **Rutgers, The State University of New Jersey**  
New Brunswick, NJ  
*Ph.D., October 2013*
- 09/01 – 06/05      **Wellesley College**  
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**Work Experience**

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- 09/10 – 06/12      **Department of Psychology, Rutgers University**  
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*Research and Evaluation Coordinator*
- 09/08 – 09/10      **Department of Psychology, Rutgers University**  
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- 07/06 – 07/08      **New York State Psychiatric Institute**  
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- 10/05 – 06/06      **New York State Psychiatric Institute**  
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**Teaching Experience**

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- 01/12 – 05/12      **Department of Psychology, Rutgers University**  
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