# Neighborhood, Family and Individual Influences on School Physical Victimization

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## Abstract

Few studies on the correlates of school violence include school and neighborhood influences. We use ecological systems theory and social disorganization theory to simultaneously incorporate neighborhood (e.g., concentrated poverty, residential instability, and immigrant concentration), school, family, and individual predictors of physical school victimization longitudinally among a large socio-economically and ethnically diverse (49% Hispanic; 34% African American) sample of 6 and 9 year olds (49% female) from the Project on Human Development in Chicago Neighborhoods (PHDCN). These children were followed up at Wave II at ages 8 and 11 (n=1425). Results of Hierarchical Generalized Linear Models reveal neighborhood residential instability increases school victimization net of family and individual correlates. Furthermore, cross-level interactions were also supported where residential family mobility has a stronger risk influence in areas of high residential instability. Also, the influence of residential family mobility is decreased in areas with higher levels of immigrant concentration. We also found cross-context connections where parent-to-child aggression in the home is connected to a higher risk of victimization at school. The role of neighborhood and family residential instability on victimization warrants further research.

### Keywords

School Victimization; Ecological Perspective; Neighborhood Influences; Family Influences; Individual Influences

## Introduction

Research shows detrimental consequences of student victimization experiences (Glew, Fan, Laton, Rivara and Kernic 2005; Nansel, Haynie and Simons-Morton 2007; Rigby 2003). These problems are found as early as middle childhood where being a victim of bullying increases the longitudinal risks of behavior problems and school adjustment problems (Arsenault et al. 2006). Victimization experiences at school may be particularly influential on well-being as children develop and school contexts gain salience in children's everyday lives (Aber, Gephardt, Brooks-Gunn and Connell 1997). School victimization in childhood has further implications for adolescent well-being. Early adolescence is a period of

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heightened bullying (Espelage and Swearer 2003) and violent victimization also reaches peak life course levels in adolescence (MacMillan 2001. Since prior victimization predicts future victimization or "re-victimization" experiences and exposure to violence compromises academic attainments (MacMillan and Hagan, 2004; Patton, Woolley and Hong, 2012), attention to the etiology of childhood school victimization will inform early avenues of prevention and intervention (Finkelhor, Ormrod, and Turner 2007; Widom, Czaja, and Dutton 2008).

Most broadly, school violence has been defined as "any behavior intended to harm, physically or emotionally, persons in school and their property" (Benbenishty and Astor 2005, p. 8). School victimization may be defined in a number of forms (e.g., physical and social /emotional victimization) and types (e.g., peer victimization and gang violence in schools). Measurement of school victimization varies across studies. The prevalence of school victimization (including simple assault, serious violent crimes, as well as theft) according to national U.S. data on 12–18 year olds has declined from 1995 to 2005 from 10 to 4 percent in the past 6 months, with steady levels to 2009 (Dinkes, Kemp and Baum 2009; Robers, Zhang and Truman 2012). Experiences of student bullying include being made fun of as well as physically harmful behaviors, with prevalence estimates around 28–33% (Dinkes et al. 2009; Robers et al. 2012). At-school bullying behaviors involving physical harm are around 9% for being pushed, shoved, tripped, or spit on, and about 6% of 12–18 year olds report being threatened with harm (Robers et al. 2012). In this study, we focus on physical victimization behaviors reported as occurring at school.

## Theoretical Perspectives

Individual, family and school factors contribute to school victimization while fewer studies have investigated community influences (Hong and Espelage 2012). We address this gap in research by attending to structural neighborhood influences on physical school victimization in childhood. Our research on simultaneous influences on school victimization draws on ecological systems theory (Bronfenbrenner 1979; 1989; 1994), and social disorganization and neighborhood effects perspectives (Laub and Lauritsen 1998; Sampson, Raudenbush and Earls 1997; Sampson 2012). The ecological systems model identifies individual characteristics, microsystems, and exosystems as influential on bullying and victimization (Benbenishty and Astor 2005; Espelage and Swearer 2003; Laub and Lauritsen 1998; Swearer and Doll 2001). The ecological approach examines children embedded in families and schools, which are situated in neighborhoods (Brooks-Gunn 1995). Individual characteristics include "social address" indicators (Bronfenbrenner 1989) or features of location in social structures including race, class, age and gender. A microsystem embraces proximal social processes and involves roles, activities and interpersonal relationships in face-to-face settings (Bronfenbrenner 1994, p. 1645). Examples of microsystems include interactions in family and school social settings.

In ecological systems theory an exosystem involves linkages and processes between two or more settings, one of which does not contain the child, but affects the setting in which the child lives (Bronfenbrenner 1994: 1645). More information is needed on what aspects of neighborhoods and community contexts are influential in ecological systems theory as predictors of child victimization and bullying (Barboza et al. 2009; Espelage, Bosworth and Simon 2000; Hong and Espelage 2012). Residential neighborhoods are part of students' ecology since about 69 percent of elementary students attend their neighborhood schools in 1994 in Chicago, the time of the first wave of data collection for the data we use in this research (Correa, Easton, Johnson, Ponisciak and Rosenkranz 2004). Very little ecological research has been conducted on student victimization longitudinally (Laub and Lauritsen 1998). We use the first two waves of the Project on Human Development in Chicago Neighborhoods data to do so.

Drawing on social disorganization and neighborhood effects perspectives, we posit three neighborhood structural features that may be influential on children's school victimization: residential instability, concentrated disadvantage, and immigrant concentration (Sampson et al. 1997; Sampson 2012). Also central to a developmental ecological model of school victimization are interaction effects (Brooks-Gunn 1995): we systematically consider cross-level interactions between key individual risk factors and our three focal structural neighborhood characteristics. In accordance with our ecological model, we next review extant research on individual, family, school, and neighborhood influences on school victimization experiences.

## Individual Characteristics

Children's school victimization is associated with a range of socio-demographic factors. Most but not all studies have shown that males were more likely than females to be physically victimized at school and out of school than girls (Card et al. 2007; Popp and Peguero 2011). Research is less clear on race/ethnicity where some research finds African American and Hispanic youth were more likely to be victimized at school than whites (Peguero 2012); Dinkes et al. 2009; Nansel et al. 2001) yet other research finds little support for a consistent association between school peer victimization and racial minority status (Card et al. 2007; Hong and Espelage 2012; Robers et al. 2012). Some research taking into account school factors among adolescents found in contrast a protective effect of racial minority status on school assault (Burrow and Apel 2008) and violent school victimization (Popp and Peguero 2011). Several studies found that Hispanic students are less likely to experience peer victimization among elementary students (Hanish and Guerra 2000) and violent victimization at school compared to non-Hispanic whites among adolescents (George and Thomas 2000; Schreck et al. 2003); however, African Americans experienced more than non-Hispanic whites (George and Thomas 2000). More research is needed on race/ethnicity net of multilevel factors.

Individual level correlates of school victimization further include age, socio-economic status and student behavior problems. Associated with advancing age and grade levels are lower physical victimization risks at school (Khoury-Kassabri 2011), criminal victimization (Wynne and Joo 2011), general bullying victimization (Due et al. 2009), and personal victimization (Gottfredson and DiPietro 2011). Mixed findings have emerged on family socio-economic status (SES) and child victimization associations (Hong and Espelage 2012). Some studies show little connection between family SES and victimization (Card et al. 2007), others show low SES is a risk factor for children's school victimization (Due et al. 2009; Jansen et al. 2012), and several studies find high SES was associated with more school victimization (Burrow and Apel 2008; Wynne and Joo 2011). These studies vary in ages of children, measures of SES and in the operationalization of victimization. More research is needed to clarify these linkages. Furthermore, at the individual level of analysis, student misbehavior and externalizing problems also were associated with victimization among adolescents (Lila, Herrero and Gracia 2008; Popp and Peguero 2011; Card et al. 2007; Cook, Williams, Guerra, Kim & Sadek 2010).

An emerging risk factor for victimization is individual residential mobility, although research on student forms seldom considers this factor. Further work is necessary as national research on adolescent violent victimization has found that residentially mobile youth had higher levels of violent victimization than those who are non-mobile (Haynie and South 2005). Residential newcomers may be less embedded in protective networks, where "others view them as having fewer resources to counter personal attacks" (Haynie and South 2005, p. 363). Since victimization is more likely on "those they perceive as alone, weak or compliant" (Haynie and South 2005, p. 363), those who are new to neighborhoods may be without social capital in the form of established protective personal relationships. Other

research on residential moves among adolescents point to reductions in social capital and increases in social stress (Hagan, MacMillan and Wheaton 1996) that may increase the perceived ease of victimization on the part of aggressors with less fear of retaliation or resistance (Haynie and South 2005; Hoglund and Leadbeater 2004; Schreck et al. 2003). Among adolescents, individuals' residential instability elevated school assault victimization, although this effect was explained by school factors (Burrow and Apel 2008). Sharkey and Sampson (2010) found that moving effects were contingent in influences on violent victimization. Also finding interactive effects, Hagan and colleagues (1996) found that individual residential mobility influences on educational attainment were modified by parental support. Residential moves increased behavioral problems among young children (Hoglund and Leadbeater 2004), but more work is needed regarding the direct and interactive influences of individual residential mobility on their school victimization.

## Microsystem

Microsystem influences on school victimization include interactions in family and school contexts. Regarding parent-child relationships, child maltreatment in families was a risk factor for subsequent bullying victimization where children learn interaction styles associated with feeling powerless and being unable to protect themselves from harm (Bowes et al. 2009; Duncan 2011; Finkelhor and Browne 1985; Hong and Espelage 2012; Shields and Cicchetti 2001). Furthermore, Khoury-Kassabri (2011) found that student reported teacher physical victimization at the classroom level was positively associated with student physical victimization levels, showing associations among teacher and peer victimization. We test for parent-to-child physical aggression as a longitudinal risk factor for children's school victimization in this study of young children. We also include prior school exposure to violence as a risk factor.

Finally, some research points to the importance of school type for student victimization. Attending public compared to private school was a risk factor for school victimization in bivariate analyses (Schreck et al. 2003), although several studies find no net associations in multivariate results (George and Thomas 2000; Lila et al. 2008; Wynne and Joo 2011; Schreck et al. 2003.) Recent national U.S. findings show a higher prevalence of school theft and violent victimization and school bullying victimization in public compared to private schools suggesting school type should be taken into account (Robers et al. 2012). We therefore include school type in these analyses.

## Exosystem

Research is emerging on children's school victimization on the role of social contexts including neighborhood and school environments, but remains sparse (Hong and Espelage 2012). A study on school bullying (Espelage et al. 2000) and perceptions of school safety (Hong and Eamon 2012) found an influential role of neighborhood safety perceptions as an exosystem factor. Studies are further needed that use clustered neighborhood research designs, with multiple children in the same community, especially ones that are longitudinal. A recent meta-analysis found evidence of small community effects on bullying victimization experiences in childhood and adolescence (Cook et al. 2010). Social disorganization theory in criminology provides a theoretical basis for these connections where areas with low socio-economic status and high population turnover have fewer resources to informally control crime and delinquency as well as victimization (Shaw and McKay 1942 [1969]; Sampson et al. 1997; Sampson 2012; Laub and Lauritsen 1998).

Cross-national studies have found that community and school socio-economic status and poverty levels increase the risk of student victimization (Khoury-Kassabri et al. 2004; Astor and Zeira 2004), although some research finds no associations (Popp and Pegeuro 2011;

Jansen et al. 2012). Low socio-economic status was associated positively with increased physical victimization from Grades 1 to 2 (Leadbeater, Hoglund and Woods 2003), being a victim of frequent bullying among middle school students (Bradshaw et al. 2009), and property victimization among 10th Graders (Popp and Peguero 2011). Additionally, in U.S. data with 8th graders, higher school SES was protective on student victimization (George and Thomas 2000). An international study clarifies that the measurement of SES may affect conclusions regarding victimization: a study of 35 countries found school mean affluence was not associated with a general measure of student bullying victimization, however, socio-economic disparity at the school level was associated with increased bullying victimization (Due et al. 2009). Together, these studies support a direct influence of socio-economic factors.

Social disorganization perspectives on violence include a focus on residential instability where high population turnover in neighborhoods leads to lower participation in community institutions, decreasing residents' ability to exert informal social control and prevent violence (Laub and Lauritsen 1990; Sampson et al. 1997; Sampson 2012). Coleman's (1988) social capital theory further pertains where stable residence in communities leads to more social capital, enhancing neighborhood resources affecting child development (Brooks-Gunn 1995). Accordingly, neighborhood residential stability decreased violent victimization (Sampson et al. 1997), although it had no net influence on parent-to-child physical aggression (Molnar, Buka, Brennan, Holton and Earls 2003). Counter to social disorganization predictions, Bradshaw and colleagues (2009) found that higher student mobility in schools decreased bullying victimization among middle school students; however, it increased retaliatory attitudes among elementary school students. A combined measure of community urban immigration and residential mobility did not influence personal or property victimization among adolescents (Gottfredson and DiPietro 2011). Mixed findings regarding neighborhood residential instability may be due to contingent influences as found in research on child maltreatment (Coulton, Crompton, Irwin, Spilsburg, and Korbin 2007). Thus, the potential main and interactive influences of neighborhood residential mobility on student victimization need further investigation.

Neighborhoods with high levels of immigrants show both risk and protective effects on violence and victimization. On the one hand, ethnic and linguistic heterogeneity may reduce neighborhood informal social control, but in immigrant communities may offer a wealth of social ties and community resources for residents (Desmond and Kubrin 2009; Sampson et al. 1997; Molnar et al. 2003). Protective influences on violence were found in research across different operationalizations of immigrant concentration (Desmond and Kubrin 2009; Molnar et al. 2003). Furthermore, work with adolescents found interactive effects where immigrant concentration is conditionally protective on violence depending upon individual race/ethnicity (Desmond and Kubrin 2009). Research on immigrant concentration is now further emerging on childhood victimization, although it remains sparse. However, neighborhood immigrant concentration reduced parent-to-child physical aggression in a diverse sample of children and adolescents (Molnar et al. 2003). Further work is needed on this potentially protective neighborhood influence on children's school victimization both in terms of main effects and conditional influences.

## Current Study

Our research questions are as follows: (1) What individual characteristics influence physical school victimization using longitudinal data?; (2) What are the influences of microsystems (parent-child relationships and school environments) on physical school victimization?; and (3) What are the influences of the neighborhood exosystem on physical school victimization? Are these influences contingent on parallel individual characteristics?

We have three hypotheses. First, in addition to other individual level risk factors, residential mobility will increase young children's school victimization. Second, neighborhood residential instability and concentrated poverty will increase children's school victimization net of individual controls, while neighborhood immigrant concentration may reduce it or not show an association. Finally, cross-level interactions are posited between the three focal neighborhood structural factors and similar factors at the individual level. While immigrant concentration should buffer individual risk factors, residential instability and concentrated poverty should exacerbate individual risks for children's school victimization. Our analytic plan is to test these hypotheses using hierarchical linear models for analyzing victimization experiences among children nested in neighborhoods. We will first test for between neighborhood variation in school victimization. We will then add individual characteristics and microsystem variables. We then will add exosystem neighborhood factors. Finally, we will test cross-level interactions.

## Method

Our sample is comprised of children aged 6 and 9 at Wave I from the Project on Human Development in Chicago Neighborhoods (PHDCN) who are representative of 6 and 9 year olds living in Chicago in the mid 1990's (Inter-University Consortium for Political and Social Research (ICPSR) 2010a). In these analyses, we use data gathered from children's primary caregivers who was the person who spent the most time taking care of the child. Most primary caregivers were female and the majority of these were biological mothers (Xue, Leventhal, Brooks-Gunn and Earls 2005). Interviews were conducted in English, Spanish, and Polish (Earls and Visher 1997). Children in these age groups had prospective parent reported information available on parent-to-child physical aggression, school exposure to violence and school victimization, as well as children's behavior problems. Data were collected at approximately 2 to 2.5 year intervals (Gardner and Brooks Gunn 2009). The response rate for cohorts 6 and 9 were 75% and 75.9% in keeping with the overall study response rate of 75% at Wave 1. At Wave 2, the response rate for primary caregivers of Cohort 6 was 88.3% and 86.6% of Cohort 9 similar to the overall response rate of 85.93% (Inter-University Consortium for Political and Social Research 2010 b). The average age of children in these cohorts was approximately 7 ½ at Wave 1 and 9 ½ at Wave 2.

Of the 847 census tracts in the city of Chicago, 343 neighborhood clusters (2 to 3 census tracts each) were formed by cluster analyses of 1990 U.S. Census data, knowledge of Chicago neighborhoods, and the identification of geographic boundaries (e.g., railroad tracks, parks, freeways) (Sampson et al. 1997). These neighborhood clusters were then cross-classified by racial and ethnic composition (7 groups including primarily African American, Hispanic, and non-Hispanic White neighborhoods with 75% or more of the respective race/ethnicity as well as racially/ethnically heterogenous neighborhoods, with at least 20% of any two of the primary racial and ethnic categories) and socio-economic status (high, medium, and low) forming 21 strata (Fauth, Roth and Brooks-Gunn 2007; Sampson et al. 1997). However, three cross-classified cells revealed that there were no low SES predominantly white neighborhoods, no high SES predominantly Hispanic neighborhoods, as well as no High SES and at least 20% Hispanic and at least 20% African American neighborhoods (Sampson et al. 1997). A stratified probability sample was used to select 80 neighborhood clusters from the strata identified in Chicago. This component of the study then sampled children from these 80 neighborhoods that were within the targeted cohort age categories of 0, 3, 6, 9, 12, 15 and 18 years. Children within 6 months of the targeted cohort age range were eligible for inclusion in this longitudinal component, and primary caregivers of each cohort also participated. Telephone interviews were conducted when in-person interviews were not possible. Neighborhoods were operationalized through census tracts that corresponded to the 80 neighborhood clusters in the Longitudinal Cohort Study of the

PHDCN. In the current article, 1425 children were analyzed in 168 census tracts, or about 8.5 children per tract. Neighborhood influences on children's mental health and cognitive scores have been conducted similarly using census tracts with the PHDCN data (Xue et al. 2005; Sharkey 2010).

## Measures

### Exposure to Violence

**School Victimization (W2):** At Wave 2, items were asked of primary caregivers regarding children's victimization experiences for both Cohorts 6 and 9 from the "My Child's ETV" instrument to create an index of levels of school victimization. Items asked whether the child has 1) ever been chased when s/he thought that s/he could really get hurt?; 2) ever been hit, slapped, punched, or beaten up?; 3) ever been attacked with a weapon, like a knife or a bat?; 4) ever been shot?; and 5) ever been shot at? If an item was answered affirmatively, the parent was asked whether this happened in the past year and if so where it happened. Positive responses were coded 1 if the victimization experience occurred in the past year and the location was indicated as having occurred at school. The majority of children had a score of zero, one or two incidents on this measure, indicating skewness in the overall variable distribution. Therefore, following other approaches to measuring school victimization (Wynne and Joo 2011, Schreck et al. 2003; Peguero and Popp 2012; Popp and Pegeuro 2011), a dichotomous variable was created from positive responses to these five items to indicate any school victimization at Wave 2. The majority of physical victimization experiences included positive responses to items 1 and 2 above.

**Exposure to Violence at School (W1):** Four items were asked of primary caregivers of children aged 6 and 9 at Wave 1 regarding whether their child has 1) ever seen or been present when somebody was shoved, kicked, or punched?; 2) ever seen or been present when someone was attacked with a knife?; 3) ever heard a gun shot?; 4) ever seen or been present when someone was shot? If an item was answered affirmatively, the parent was asked when and where the incident happened. Affirmative responses to these items were each coded 1 when the parent indicated the event happened in the past year and at the child's school or daycare. A dichotomous variable was created from answers to these four items to indicate any exposure to violence at school at Wave 1. The majority of this violence involved seeing or being present when someone was shoved, kicked, or punched.

**Parent-to-Child Physical Aggression (W1):** Primary caregivers were asked items at Wave I from the Conflict Tactics Scale (CTS-1) (Straus 1979 regarding when they had a problem with their child in the past year. Parent responses to the questions of how many times they had 1) thrown something at (him/her)?; 2) pushed, grabbed, or shoved (him/her)?; 3) slapped or spanked (him/her) with an open palm?; 4) kick, bite, or hit (him/her) with a fist?; 5)hit or try to hit (him/her) with something?; 6) did you beat (him/her) up? Items 3 and 5 above were the most commonly endorsed items. Responses were originally recorded on a scale of never (0) to more than 20 times (6). All positive responses were coded as one on each item to form binary measures of each item. An additive count score was formed from positive responses to the six items.

### Behavior Problems

**Externalizing Behavior Problems (W1):** Primary caregivers were asked questions from the Child Behavior Checklist (CBCL) (Achenbach 1991 regarding their child's aggressive (e.g., destroys things belonging to others, gets in many fights) or delinquent behavior problems (e.g., steals at home, steals outside the home) in the six months preceding the interview. Responses were recorded on a scale of not true (0), somewhat true (1) or very true

(2). A composite scale was formed of externalizing problems from these items with a Cronbach's of .89.

**Other Individual Risk Factors and Control Variables:** The number of residential moves in the past five years was measured through a series of questions asking for how long the respondent lived at each reported address if they had moved in the past five years (Sampson et al. 1997). A count index was created of up to five moves in the previous 5 year period. Children's gender was coded dichotomously to indicate being male (1) compared to female (0). Chronological age of the child was coded in years at Wave I. Race and ethnicity of the subject child was indicated by two dichotomous variables indicating Hispanic group membership and African American group membership compared to a referent category of non-Hispanic whites. Individuals of other race and ethnicities were too few in number to include in these analyses. Household socio-economic status was formed as an index from a principal components analysis of measures of parent education, income and occupational prestige (Molnar et al. 2003; Sampson et al. 1997).

**Neighborhood and School Characteristics:** A scale of residential stability has been produced with high factor loadings (Sampson et al. 1997), and we used these scale components to create an index of residential instability using 1990 decennial census data for the census tracts in Chicago. This measure includes the percentage of persons not living in the same house as 5 years earlier and the percentage of non-owner occupied homes (r=.54, p<.001). The variables were standardized and mean scores were derived to measure residential instability. Neighborhood poverty was measured by the percentage of residents living below the poverty level in the census tract. A scale of neighborhood immigrant concentration was created from two variables also with high factor loadings used in prior work (Sampson et al. 1997): the percentage of Hispanics and the percentage of foreign born residents in the census tract (r=.76, p<.001). Finally, school type was operationalized by a question asked of primary caregivers for children in Cohorts 6 and 9 regarding the school that they most recently attended at Wave 2. Parents were asked "what type of school is this" and responses were coded 1=public school and 0=other school types.

## Results

Descriptive statistics for the sample indicate that the prevalence of school victimization at Wave 2 of the study is at 6% according to parental reports. The racial and ethnic composition of the sample includes 49% Hispanic children, 34% African American children and 17% non-Hispanic whites. Fifty-one percent of the sample is male. Household socio-economic status shows diversity among the sample, ranging from a score of −3.16 to a score of 3.52. Approximately 83% of the children attend public schools. Children's exposure to violence at school at Wave 1 is about 10%, according to parental reports.

We conducted HGLM analyses of our binary measure of young children's school victimization using HLM7 with overdispersion and robust standard errors (Raudenbush and Bryk 2002; Raudenbush, Bryk, Cheong, Congdon and Du Toit 2011). Continuous predictors were grand-mean centered in these analyses. We begin with an unconditional random intercepts model using a Bernoulli sampling model and a logit link function and no predictors at the child or neighborhood levels of analysis.

Our first model in Column 1 of Table 2 is represented by two equations. At Level 1 the child level model is: $_{ij} = _{oj}$. At Level 2 or the neighborhood level the model is: $_{oj} = _{00} + u_{oj}$. As indicated in Column 1 of Table 2, the average log odds of school victimization across neighborhoods is −2.63 (se= .10), corresponding to an odds ratio of .07.

We add individual and school predictors in Column 2. This model is represented through two equations, where the child model is: $_{ij}=_{0j}+_{1j}(X_{ij})+\ldots_{10j}(X_{ij})$ and the neighborhood model is: $_{0j}=_{00}+u_{0j}$. In this model the intercept is random and the other coefficients are fixed. In support of Hypothesis 1, the results indicate residential moves increase the log odds of school victimization (b=.23, p<.01) or by an odds ratio of 1.26, net of controls. Parent-to-child physical aggression at Wave 1 increases school victimization at wave 2 by a similar odds ratio of 1.27. This model also shows that males are more than twice as likely to experience school victimization as are females (b=.81, p<.001). Hispanic youth are less likely than whites to experience school victimization (b=−.83, p<.001). These results obtain net of prior levels of school exposure to violence (b=.67, p<.05). Externalizing problems at Wave 1 also increase the log odds of school victimization at Wave 2 (b=.03, p<.001). Higher household socio-economic status is associated with more school victimization (b=.20, p<.05). The bivariate correlation for household SES and school victimization is also positive although weak (r=.05, p<.05). Attending a public school increases the risk of school victimization (b=.63, p>.05).

In Columns, 3–6, we tested whether there were neighborhood influences on student physical victimization. Residential instability increased the log odds of school victimization among children (b=.52, p<.001), corresponding to an odds ratio of 1.68. Neighborhood concentrated poverty also increases school victimization (b=.02, p<.05). However, immigrant concentration did not directly influence student victimization (b=.10, p>.10). In Column 6, these neighborhood factors are entered together, with residential instability showing a net risk influence on student victimization (b=.57, p<.001). This neighborhood influence is shown graphically in Figure 1 where higher levels of census tract residential instability are associated with a higher probability of children's school victimization.

As shown in the results presented in Table 3, we next tested nine cross-level interactions between our focal three neighborhood structural factors (e.g., residential instability, concentrated poverty, and immigrant concentration) and similar factors at the individual level (e.g., family moves, family socio-economic status, and race/ethnicity). Nine cross-level interactions were conducted rather than twelve since regarding the individual level factor of race/ ethnicity the between neighborhood variability was significant for the African American slope but not the Hispanic slope. As shown in Model 1 of Table 3, we found that neighborhood residential instability was further contingent on family residential moves. Children in families with more moves living in residentially unstable neighborhoods experienced more school victimization. This is shown in Figure 2 where students with 2 moves in the past five years living in residentially unstable neighborhoods had about a 20% risk of being physically victimized at school, with all other values held at mean levels. This risk is lower for children with similar family moves but living in residentially stable neighborhoods (at less than 5%).

Furthermore, family residential moves were buffered by neighborhood immigrant concentration. As shown in Figure 3, children living in families with more moves in areas with low levels of immigrants had about a 13% risk of physical school victimization. However, in areas with high levels of immigrant concentration, children with more family moves had about a 4% risk of physical school victimization. Two other unanticipated cross-level interactions were found, as seen in Column 3 of Table 3 where family SES was less of a risk factor in residentially unstable areas, and family SES had a stronger risk influence in areas with a higher level of immigrant concentration. The other five cross-level interactions were non-significant.

## Discussion

We use an ecological perspective (Bronfenbrenner 1979; 1989; 1994) to understand school victimization among children longitudinally. We found influences of individual, family, school, and neighborhood factors. Since neighborhood factors have seldom been studied as influences on school victimization (Hong and Espelage 2012; Laub and Lauritsen 1998) our research contributes information on which aspects are influential. We were guided by social disorganization theory and neighborhood effects research (Sampson et al. 1997; Sampson 2012) in examining the influences of residential instability, concentrated poverty and immigrant concentration. Our research suggests attention to the exosystem context of neighborhoods will enhance the explanation and potentially the prevention of school victimization. We next summarize our major findings in relation to extant research, followed by a discussion of our study's limitations, and suggestions for future research.

Our results support ecological systems theory and social disorganization theory on predictors of school physical victimization in a diverse urban sample. Our finding on the risk influence of neighborhood residential instability net of individual, family and school covariates in longitudinal data is particularly salient. The associations of residential instability with school victimization add to other criminological research on risks for victimization more broadly (Sampson et al. 1997). Furthermore, our research highlights that residential instability, among the structural features of neighborhoods tested, is especially important to child victimization. This factor is anticipated but underacknowledged in ecological systems theory, considering the more recently theorized role of instability on proximal processes: "(p)articularly significant in the latter sphere is the growing hecticness, instability, and chaos in principal settings in which human competence and character are shaped, in the family, child-care arrangements, schools, peer groups and neighborhoods" (Bronfenbrenner and Morris 1998, p. 995).

Our findings support a broader literature on children and youth development on the risk of family instability in the form of multiple transitions in family structure or "churning" influences as risks for well-being (Fomby and Cherlin, 2007) but uniquely contributes evidence on the broader ecological context of residential instability influences. Furthermore, we add to the literature on instability influences by focusing on victimization rather than the now well-documented associations between family changes with problem behaviors (Foster, Nagin, Hagan, Costello and Angold 2010; Thornberry, Smith, Rivera, Huizinga and Stouthamer-Loeber 1999; Najman et al. 1997). Community and city efforts to reduce instability in the neighborhood domain may guard against children's school victimization. Our findings show that, at the individual level, more residential moves in the past 5 years increase the risk of school victimization among young children as found on adolescent victimization experiences (Burrow and Apel 2008; Haynie and South 2005; Sharkey and Sampson 2010). Future work on younger children should attend to residential instability at both the neighborhood and family levels of analysis, as well as their cross-level interaction. Additional research on residential instability in association with young children's victimization may also may build fruitfully on the prospective residential moves work of Sampson (2012) and Sharkey and Sampson (2010).

Our results further add to work on ecologies of instability whereBradshaw et al. (2009) found that school mobility exerted a protective influence on frequent bullying. We instead find a risk effect for neighborhood residential instability on school victimization. The difference in results across these studies may be due to our emphasis on neighborhood rather than school mobility as facilitated by a community based research design. As noted, the majority of elementary students in Chicago at the time of the first wave of the data used attended schools in their residential neighborhoods (Correa et al. 2004). We also examined

physical school victimization rather than a measure of more general frequent bullying victimization.

Furthermore, our analyses show that immigrant concentration in the community decreases the association between the number of moves on school victimization. A protective main effect of neighborhood immigrant concentration has been found in prior work on parent-to-child physical aggression (Molnar et al. 2003). Neighborhood immigrant concentration is also protective on other violence (Sampson 2008). We extend this work to identify the protective influences of immigrant concentration in buffering the effects of family moves on children's school victimization experiences. Policies increasing immigrants in American communities also may serve to reduce school violence.

Our work on neighborhood influences on children's school victimization adds to contextually grounded research on child maltreatment (Molnar et al. 2003; Coulton et al. 2007) and pertains to emerging cross-national research (Benbenishty and Astor 2005; Khoury-Kassabri et al. 2004). Together, our findings on family moves and other child risk factors and neighborhood risk (e.g., residential instability) support our study hypotheses. However, in contrast to our hypotheses, a risk effect was not found for neighborhood concentrated poverty on children's school victimization. This differs from related research with Israeli students (Khoury-Kassabri et al. 2004) but is in keeping with a lack of neighborhood SES influences on young children's student victimization in a Dutch study (Jansen et al. 2012). Furthermore, immigrant concentration served as a buffering factor rather than a main effect. Cross-level interactions between our three focal neighborhood factors and similar child factors were supported in four of nine specifications. Two of these are in accordance with our hypotheses.

Our longitudinal models took into account a feature of the school microsystem in all analyses: school exposure to violence at Wave 1. These models approximate change-score models in that prior levels of exposure to violence at school are taken into account in predicting school victimization at Wave 2. This modeling approach aids in guarding against unobserved sources of spuriousness (Allison 1990); Kessler and Greenberg 1981). However, the exposure to violence measure at school at Wave 1 is broader than the Wave 2 direct victimization measure as it combines witnessing and victimization experiences together. The longitudinal design also permits the separation of residential instability influences among other factors at the individual and neighborhood levels of analysis prior to the observation of school victimization at Wave 2, adding to what is known from cross-sectional analyses.

Also involving micro-system influences, our results support connections in victimization experiences across contexts in showing a link between parent-to-child physical aggression at Wave I on school victimization at Wave 2, even net of prior school violence exposure (Shield and Cicchetti 2001; Bowes et al. 2009). This link between experiences of violence is a type of revictimization connecting home and school experiences (Malik, Sorenson, and Aneshensel 1997; Finkelhor et al. 2007; Widom et al. 2008). Children exposed to parental aggression are an at risk group for further victimization at school, net of exosystem factors.

Our research shows a prevalence of physical school victimization at 6% among 7.5 to 9.5 year olds, in keeping with estimates from national research with adolescents (Dinkes et al. 2009; Robers et al. 2012). However, this may be an underestimate of children's physical victimization at school, raising limitations to our study. The data we use are from a community study and do not have information from teachers regarding student victimization. We instead rely on parental reports. Future work would best incorporate both parental and teacher reports on victimization in examining neighborhood influences. As well, future work should take into account the number of victimization experiences children

have at school. Student school physical victimization showed a limited distribution in this study facilitating a binary operationalization. Further work also should examine at-school victimization among older children who provide self-report information on their school experiences. Additional research should attend further to school processes that may mediate neighborhood influences (Burrow and Apel 2008; Wynne and Joo 2011). Further work on structural neighborhood factors on children's school victimization as measured with multiple methods also would strengthen our conclusions. More testing of ecological theory on other types of children's victimization at school beyond the physical domain also would forward research.

However, our results with a community sample provide a unique opportunity to test direct and interactive community influences on school victimization that may stimulate future research. One of the strengths of this study is the use of a neighborhood based sample of children. A previous study on student victimization using community characteristics surrounding schools from a school-based sample found no neighborhood influences (Clark and Lab 2000). Our work adds to prior work by operationalizing the residential neighborhood environment of students. Residential contextual community influences are an emerging area of policy relevance central to an ecological perspective on children's school victimization with the potential for preventive applications (Bronfenbrenner 1998; Hong and Espelage 2012). We particularly recommend sustained attention to the role of instability in ecological systems theory as anticipated by Bronfenbrenner and Morris (1998), encompassing not only family but also community contexts.

## Conclusion

School victimization is influenced by individual factors, microsystems, and research is now emerging on exosystem factors (Hong and Espelage 2012). In our longitudinal multileveled research, we found consistent support for the risk factor of residential instability, in accordance with criminological theory (Sampson et al. 1997; Sampson 2012). We also found a buffering influence of immigrant concentration on the risk effect of family moves consistent with research on the protective influence of immigration (Molnar et al. 2003; Sampson 2008). Our research has focused on children. To date, ecological systems theory has been supported in research on adolescent school bullying (Espelage et al. 2000; Barboza et al. 2009; Lee 2011). There is now a thriving literature on adolescent school victimization (Burrow and Apel 2008; Peguero, Popp and Koo 2011; Schreck et al. 2003), including risk influences of school poverty and social problems and a protective role of racial and ethnic diversity (Peguero et al. 2011; Peguero and Popp 2012), but more research is needed incorporating neighborhood factors. Research in Chicago has shown that 41.7% of high school students attend their neighborhood schools (Correa et al. 2004) suggesting residential neighborhood structural factors may be further influential on adolescents. Further research on social contextual influences on adolescent victimization is pressing since these factors may be modifiable and thus central to prevention and intervention efforts (Espelage et al. 2000).

## Acknowledgments

H. F. and J. B. G. conceived of the study, participated in its design, interpretation of the results and drafted the manuscript. H.F. conducted the statistical analyses. H. F and J. B. G. read and approved of the final manuscript.

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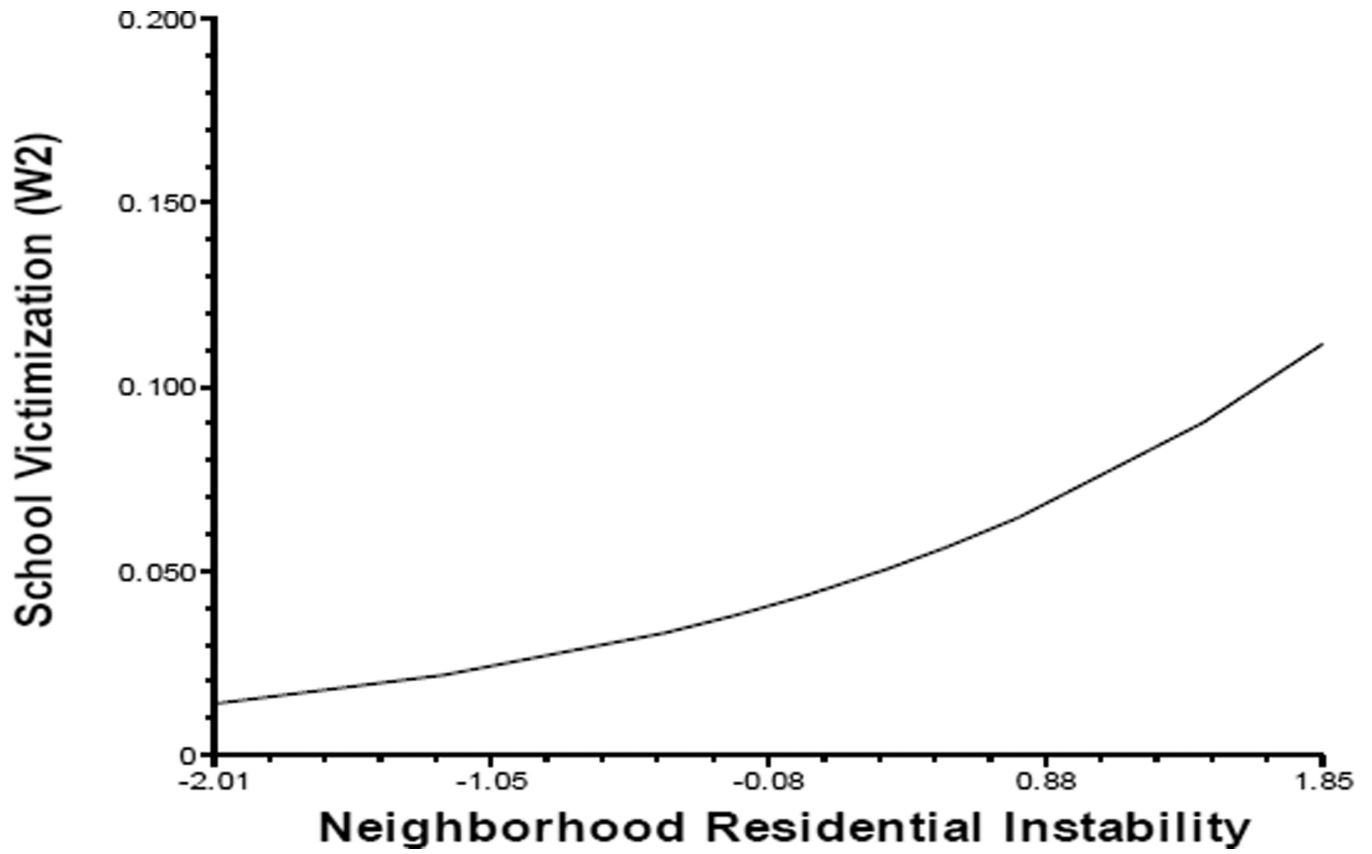
**Figure 1.**
Probability of School Victimization (W2) as a Function of Neighborhood Residential
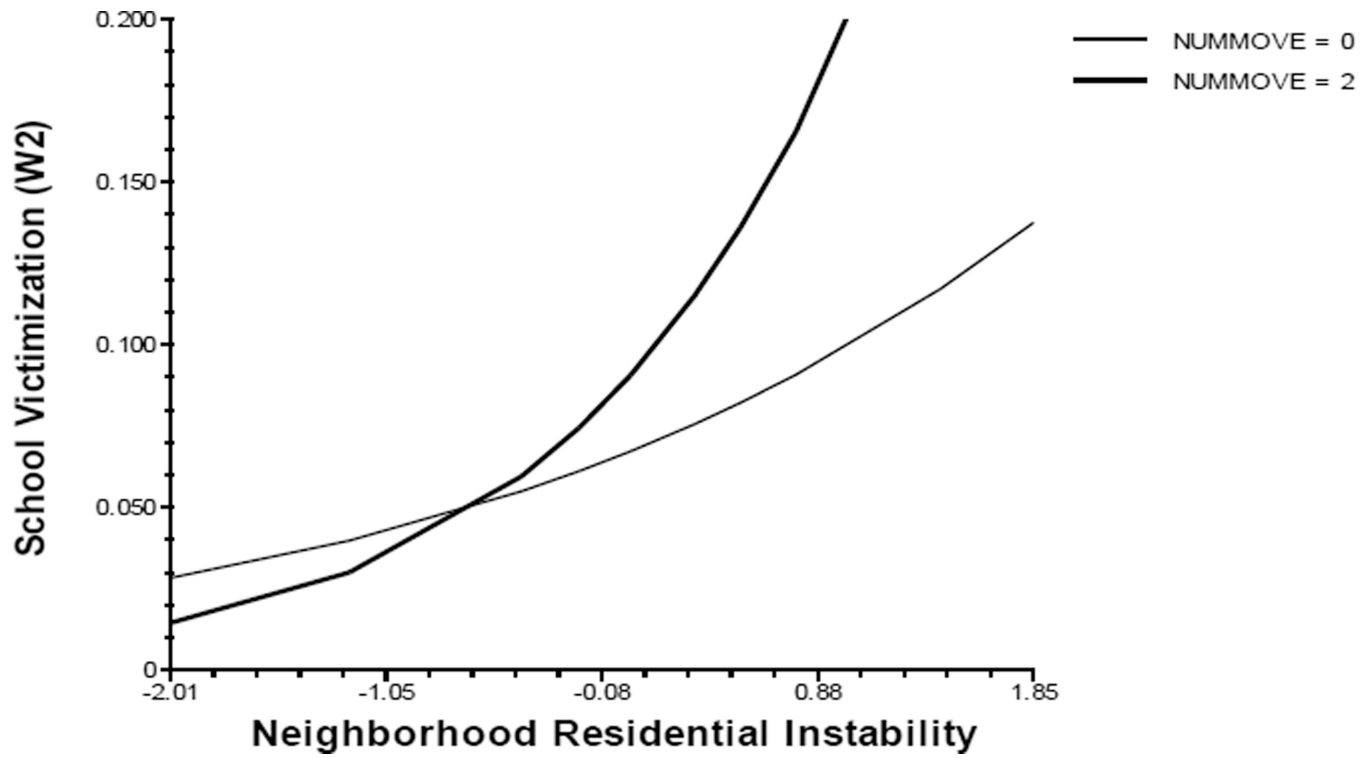Instability (all other covariates held at mean levels).

**Figure 2.**
Probability of School Victimization (W2) as a Function of Neighborhood Residential
Instability and Number of Family Moves (all other covariates held at mean levels).
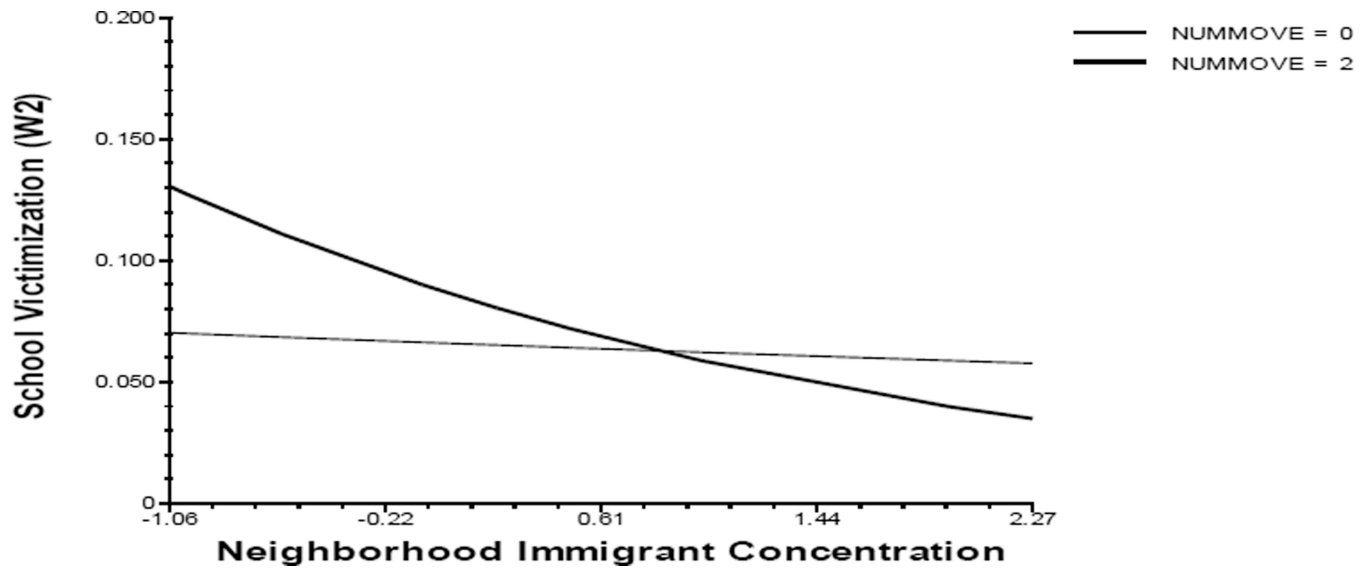
**Figure 3.**
Probability of School Victimization (W2) as a Function of Neighborhood Immigrant Concentration and Number of Family Moves (all other covariates held at mean levels).

**Table 1**

Descriptive Statistics for Children, School and Neighborhood-Level Variables.

| Variables | Full Sample (n=1425 children) | | |
|---|---|---|---|
| | Mean | SD | Range |
| *Dependent Variable* | | | |
| School victimization (W2) | .06 | -- | 0–1 |
| *Individual Level Factors* | | | |
| Residential moves | .98 | 1.09 | 0–5 |
| Age | 7.49 | 1.53 | 4.77 to 10.23 |
| Gender (male=1) | .51 | -- | 0–1 |
| Hispanic | .49 | -- | 0–1 |
| African American | .34 | -- | 0–1 |
| Externalizing behavior problems (W1) | 11.67 | 8.75 | 0–63 |
| Household socio-economic status | −.11 | 1.41 | −3.16 to 3.52 |
| *Microsystem* | | | |
| Parent-to-child physical aggression (W1) | 1.59 | 1.23 | 0–6 |
| School exposure to violence (W1) | .10 | -- | 0–1 |
| Public school | .83 | -- | 0–1 |
| *Exosystem (n=168 census tracts)* | | | |
| Residential instability | −.08 | .86 | −2.09 to 1.77 |
| Concentrated poverty | 24.68 | 17.00 | 2–84 |
| Immigrant concentration | .01 | .93 | −1.04 to 2.29 |

**Table 2**

Ecological Model of of School Victimization (W2) on Multilevel Predictors (Population Average HGLM Logistic Regression Model (with robust std. errors) (1425 children in 168 CTs) (b/sb).

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| *Fixed Effects* | | | | | | |
| Intercept | −2.63 *** | −3.66 *** | −3.61 *** | −3.55 *** | −3.65 *** | −3.62 *** |
| | (.10) | (.33) | (.37) | (.36) | (.33) | (.38) |
| *Individual Level Factors* | | | | | | |
| Residential moves | | .23 * | .20 * | .25 * | .22 * | .21 * |
| | | (.10) | (.10) | (.10) | (.10) | (.11) |
| Age | | .07 | .07 | .07 | .07 | .07 |
| | | (.06) | (.07) | (.06) | (.06) | (.07) |
| Gender (male=1)$^a$ | | .81 *** | .83 *** | .82 *** | .80 *** | .84 *** |
| | | (.21) | (.23) | (.23) | (.21) | (.23) |
| Hispanic$^b$ | | −.83 * | −.96 ** | −.93 * | −.88 * | −.86 * |
| | | (.35) | (.37) | (.37) | (.38) | (.39) |
| African American | | .22 | .16 | −.06 | .27 | .001 |
| | | (.33) | (.35) | (.35) | (.34) | (.370) |
| Externalizing behavior | | .03 *** | .03 *** | .03 *** | .03 *** | .03 *** |
| problems (W1) | | (.01) | (.01) | (.01) | (.01) | (.01) |
| Household SES | | .20 ** | .24 *** | .26 ** | .20 ** | .24 ** |
| | | (.08) | (.08) | (.09) | (.08) | (.09) |
| *Microsystem* | | | | | | |
| Parent-to-child physical | | .24 ** | .24 ** | .24 *** | .24 ** | .24 ** |
| aggression (W1) | | (.07) | (.08) | (.08) | (.07) | (.08) |
| School exposure to | | .67 * | .65 * | .69 * | .70 * | .65 * |
| violence (W1) | | (.29) | (.30) | (.30) | (.29) | (.31) |
| Public school | | .63 * | .58 $^†$ | .63 $^†$ | .61 * | .62 $^†$ |
| | | (.31) | (1.79) | (.34) | (.31) | (.34) |
| *Exosystem* | | | | | | |
| Residential instability | | | .52 *** | | | .57 *** |
| | | | (.12) | | | (.14) |
| Concentrated poverty | | | | .02 * | | .002 |
| | | | | (.01) | | (.009) |
| Immigrant | | | | | .10 | −.23 |
| concentration | | | | | (.15) | (.16) |
| *Variance components* | | | | | | |
| Between neighborhood variance | .71 *** | .74 *** | .47 $^†$ | .50 * | .76 *** | .37 |
| Level 1 extra-binomial Error | .70 | .65 | .72 | .72 | .65 | .76 |

$^†$p .10,

*
*p* .05,

**
*p* .01,

***
*p* .001 (two-tailed).

Reference category:

*a*Gender (0=female)

*b*Non-Hispanic White.

**Table 3**

Population Average HGLM Logistic Regression Model (with robust std. errors) of School Victimization (W2) on Multilevel Predictors with Hypothesized Cross-Level Interactions (1425 children in 168 census tracts) (b/sb).

|  | 1 | 2 | 3 |
| --- | --- | --- | --- |
| *Fixed Effects* |  |  |  |
| Intercept | −2.93[***] | −3.34[***] | −3.00[**] |
|  | (.22) | (.24) | (.24) |
| *Individual Level Factors* |  |  |  |
| Residential moves | .15[*] | .20[*] | .15[*] |
|  | (.07) | (.08) | (.07) |
| Age | .07[*] | .08 | .08[*] |
|  | (.04) | (.05) | (.04) |
| Gender (male=1)[a] | .64[***] | .77[***] | .62[***] |
|  | (.12) | (.15) | (.13) |
| Hispanic[b] | −.71[**] | −.87[***] | −.67[**] |
|  | (.23) | (.27) | (.22) |
| African American | .11 | −.06 | .18 |
|  | (.37) | (.29) | (.27) |
| Externalizing behavior | .02[***] | .03[***] | .03[***] |
| problems (W1) | (.01) | (.01) | (.01) |
| Household SES | .15[**] | .20[**] | .30[***] |
|  | (.05) | (.06) | (.06) |
| *Microsystem* |  |  |  |
| Parent-to-child physical | .19[***] | .21[***] | .17[***] |
| aggression (W1) | (.05) | (.06) | (.05) |
| School exposure to | .49[*] | .59[*] | .60[**] |
| violence (W1) | (.21) | (.25) | (.21) |
| Public school | .34[†] | .51[*] | .32[†] |
|  | (.18) | (.21) | (.17) |
| *Exosystem* |  |  |  |
| Residential instability | .44[***] | .57[***] | .61[***] |
|  | (.09) | (.13) | (.10) |
| Concentrated poverty | −.003 | −.01 | −.002 |
|  | (.007) | (.01) | (.008) |
| Immigrant | −.06 | −.12 | −.09 |
| concentration | (.09) | (.14) | (.11) |
| *Cross-level Interactions* |  |  |  |
| Residential instability[*] | .25[**] |  |  |
| residential moves | (.08) |  |  |

| | 1 | 2 | 3 |
|---|---|---|---|
| Concentrated poverty *residential moves | −.01[†] | | |
| | (.01) | | |
| Immigrant concentration * residential moves | −.18[**] | | |
| | (.06) | | |
| Residential instability *African American | | −.05 | |
| | | (.24) | |
| Concentrated poverty *African American | | .02 | |
| | | (.01) | |
| Immigrant concentration * African American | | −.003 | |
| | | (.28) | |
| Residential instability *Family SES | | | −.18[***] |
| | | | (.05) |
| Concentrated poverty *Family SES | | | .004 |
| | | | (.005) |
| Immigrant concentration * Family SES | | | .19[***] |
| | | | (.06) |
| *Variance components* | | | |
| Between neighborhood variance | 1.36[***] | 1.24 | 1.15[***] |
| Level 1 extra-binomial error | .42 | .60 | .47 |
| Residential moves slope | 1.25[***] | | |
| African American slope | | 2.94[†] | |
| Family Socio-economic status slope | | | .57[**] |

[†]
p .10,

[*]
*p* .05,

[**]
*p* .01,

[***]
*p* .001 (two-tailed).

Reference category:

[a]Gender (0=female)

[b]Non-Hispanic White.