Published in final edited form as:

Am J Crim Justice. 2011 December 1; 36(4): 392–407. doi:10.1007/s12103-011-9118-2.

A Multi-Level Approach to Investigating Neighborhood Effects on Physical Aggression among Urban Chicago Youth

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Abstract

The current study evaluates neighborhood effects, individual-level effects, and demographic characteristics that influence physically aggressive behavior among urban youth. Using data derived from 5,812 adolescents from Project Northland Chicago (PNC) and Hierarchical Linear Modeling (HLM) techniques, the results suggested that neighborhood problems significantly predicted physical aggression, before and after adjustment for individual-level risk factors (alcohol use, peer alcohol use, lack of adult supervision, and depression) and demographics. After accounting for baseline physical aggression, however, neighborhood problems were no longer a significant predictor of physical aggression. Implications for intervention at both the neighborhood and individual-level and study limitations are also discussed.

Keywords

Aggression; Neighborhood; Urban; Adolescence; Multilevel

Introduction

The neighborhood in which a person resides may influence their pathway to (or resistance from) criminal behavior. Studies suggest that youth living in areas characterized by social disorganization can increase an individual's likelihood of being an offender (Bellair & McNulty, 2005; Kingston, Huizinga, & Elliot, 2009; Leventhal & Brooks-Gunn, 2003; McNulty & Bellair, 2003; Sampson, Morenoff, & Gannon-Rowley, 2002; Stewart, Simons, & Conger, 2002; Wikstrom, Ceccato, Hardie, & Treiber, 2010). The theory of social disorganization provides a framework for explaining why crime rates may be higher in

communities that are characterized by high population turnover, ethnic/racial heterogeneity, and residential instability (Bursik & Grasmick, 1993; Shaw & McKay, 1942). In addition, familial, and peer group influences appear to exert a substantial influence on delinquent behavior (Cattarello, 2000; Chung & Steinberg, 2006; Haynie, Silver, & Teasdale, 2006; Welsh, Greene, & Jenkins, 1999). Although many studies have examined the relationship between social context and criminal behavior, few studies have investigated neighborhood effects on physical aggression among multi-ethnic urban youth during early adolescence.

Social disorganization theory emphasizes the concentration of high levels of population turnover, racial and/or ethnic heterogeneity, and poverty in the neighborhoods that exhibit the highest rates of crime/delinquency (Shaw & McKay, 1942). According to Shaw and McKay (1942), there is an inverse relationship between the neighborhoods' spatial distance from the central business district and their crime rates. Social disorganization emphasizes the importance of the ability of a community's residents to realize shared goals and values and regulate the conduct of its citizens (i.e., informal social control) (Berry & Kasarda, 1977; Kornhauser, 1978; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997). High population turnover may impede the ability of communities to organize effectively and to self-regulate residents' behavior because of the constant out-migration that characterizes high-crime communities.

Racial and/or ethnic heterogeneity is the second structural characteristic that may hinder the ability of communities to develop mechanisms of informal social control (Shaw & McKay, 1942). In communities that are characterized by rapid compositional change, it becomes difficult to promote a unified front against the "invasion" of other racial/ethnic groups (Bursik & Grasmick, 1993, p. 33). Furthermore, heterogeneity can inhibit communication, especially in communities that are plagued by language barriers (Kornhauser, 1978, p. 75).

Shaw and McKay (1942) also indicated that high rates of poverty/low socioeconomic status are characteristics of socially disorganized communities, frequently attributable to the constant out-migration to the suburbs of residents that had the ability to move, and the area that the former residents left behind still tended to be plagued by poverty and increased crime/delinquency rates (Shaw & McKay, 1942). These individuals who lack the opportunity and/or resources to "escape" this socially disorganized area (i.e., the inner city) have been referred to by Wilson (1987) as "the truly disadvantaged" because they have to live in areas of extreme concentrated poverty and with a high density of subsidized housing and criminal activity (Schuerman & Kobrin, 1986; Wilson, 1987).

Effect of Neighborhoods on Aggression

The geographic concentration of socioeconomic disadvantage has been attributed to the social disorganization of the neighborhoods, and these disorganized neighborhoods appear to have adverse effects on the individuals and families that reside within those areas (Bursik & Grasmick, 1993). For example, renting (as opposed to ownership) of property (Simcha-Fagan & Schwartz; Wilson & Kelling, 1982), overcrowding (Roncek, 1981; Sampson & Wilson, 1995) and residential instability (Sampson & Groves, 1989) may result in reduced neighborhood investment, development of informal social ties with neighbors due to their exposure to violence and fear of crime, and juvenile delinquency, and criminal behavior.

Among older children and early adolescents, Gephart (1997) found that community impoverishment, burden of child-care, and residential instability were significant predictors of delinquency such as violent crime, drug trafficking, juvenile delinquency, and teen pregnancy. Two additional studies have also shown that neighborhood SES had a stronger effect for male adolescents than female adolescents (Entwisle, Alexander, & Olson, 1994; Halpern-Felsher et al., 1997). Furthermore, older adolescents who resided in a high SES

neighborhood had increased levels of high school graduation and college attendance, and the protective effect of living in a higher SES neighborhood appeared to be more salient for males (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Duncan, 1994; Ensminger, Lamkin, & Jacobson, 1996; Halpern-Felsher et al., 1997). Crane (1991) has also provided evidence that males had the worst outcomes when living among low SES neighbors. In addition, a series of studies have all consistently shown that living in a low SES neighborhood was positively associated with higher rates of criminal and delinquent behavior (Braithwaite, 1979; Lindstrom, 1996; Loeber & Wikstrom, 1993; Lynam et al., 2000; Peeples & Loeber, 1994; Piquero, Brame, & Moffitt, 2005; Reiss & Rhodes, 1961; Sampson & Groves, 1989; Wikstrom, 1991a, b; Wikstrom & Loeber, 2000).

There are other neighborhood-level characteristics apart from SES that may affect an individual's risk of delinquency. For example, neighborhood resources (such community organizations and services) may be an indication of high collective efficacy within a community. This social cohesion appears to be associated with decreased aggression and other delinquent behaviors in urban communities (Molnar, Cerda, Roberts, & Buka, 2008; Sampson, 2006). Therefore, prevention at the community-level (by implementing community-based programming and services) may be instrumental in decreasing delinquency and physical aggression among residents.

Effect of Individual-Level Risk Factors on Aggression

Despite these recognizable neighborhood effects, delinquent behavior cannot be fully explained without including control measures for both familial and individual-level characteristics (see Gephart, 1997, p. 14). A large body of literature and developmental theories link association with antisocial peers with individual delinquency in adolescence, and recent evidence suggests that association with deviant peers is most influential before age 16 (Monahan, Steinberg, & Cauffman, 2009). According to this study, between ages 14 and 16, antisocial individuals select antisocial peers to associate with. In turn, the presence of these delinquent peers is positively associated with individual delinquency.

There is also evidence that delinquency is persistent within the family, and family structure and parental supervision influences delinquent behavior. Lieber, Mack, and Featherstone (2009) found a consistent relationship between delinquent behavior and maternal attachment; however, family structure was not a significant predictor of non-serious or serious delinquency (Lieber, Mack, & Featherstone, 2009). Similarly, an analysis of longitudinal data within a sample of poor African-American youth found that parenting mediated the effects of neighborhood exposure to violence on violent behavior (Spano, Vazsonyi, & Bolland, 2009). More specifically, this study showed that exposure to violence had a negative effect on parenting, and reduced parents' ability to properly monitor their children. Contrary to these findings, the literature provides substantial support for the relationship between delinquency and family structure. Adolescents who are raised in nontraditional families (e.g., structures other than two-parent households) are more likely to engage in delinquent behavior (Kierkus & Baer, 2002; Kierkus & Hewitt, 2009; Rebellon, 2002; Sampson & Laub, 1994). This increased risk of delinquency is linked to weakened family ties, as parental attachment, supervision, and communication were reduced when adolescents have alternative family structures.

Individual characteristics such as gender, race/ethnicity, self-control, parental monitoring are often the most influential predictors of delinquency. Most recently, Gibson, Sullivan, Jones, and Piquero (2010) found that individual-level characteristics (including gender, race/ethnicity, socioeconomic status, and immigrant status) predicted self-control above and beyond neighborhood-level variables (Gibson, Sullivan, Jones, & Piquero, 2010). Other studies have found similar relationships between characteristics of the individual and

physical aggression, particularly socioeconomic status, race, and gender (Haynie, Weiss, & Piquero, 2008; Wright & Younts, 2009).

The Current Study

Using Shaw and McKay's (1942) theory of social disorganization, the current study evaluates the effects of neighborhood characteristics on youth's delinquency by focusing on youth living in Chicago, a high-risk urban context. Specifically, the current study uses a multi-level approach to investigate neighborhood effects on physical aggression among urban Chicago youth during early adolescence.

Historically, Chicago has been a key location for the study of delinquency and crime (Gibson et al., 2010; Hirschfield, 2009; Sampson, 1997; Shaw & McKay, 1969; Zagar, Busch, Hughes, & Arbit, 2009). Many of these studies have examined rates of crime and delinquency among young adults. The current study focuses on the relationship between neighborhood effects and youth behavior during early adolescence. Chicago is an important context for several reasons. For instance, Chicago is an urban city characterized by high rates of violence and delinquency. Compared to the United States population, adolescents in Chicago were more likely to be in a physical fight (42.7% versus 35.9%), were in a physical fight on school property (19.5% compared to 13.5%), and reported increased physical abuse of their boyfriend or girlfriend (15.4% versus 9.2%) in the past year (CDC, 2008). These elevated levels of exposure to violence in the city of Chicago provide a venue for a study of the neighborhood effects on physical aggression among adolescents.

In the current study, we addressed two research questions. First, we examined whether neighborhood characteristics (i.e. neighborhood problems) predicted physical aggression among urban and early adolescents (ages 12 to 14). Second, we investigated whether individual-level risk factors (e.g. alcohol use, peer alcohol use, lack of adult supervision, and depression) and demographics explained the association between neighborhood characteristics and physical aggression among urban youth. Based on prior research, we hypothesize that neighborhoods will have a significant effect on physical aggression; and individual-level risk factors and demographics will explain a substantial portion of the variance in physical aggression above and beyond neighborhood effects.

Methods

Research Design

Data were derived from Project Northland Chicago (PNC), a group-based randomized trial that tested the efficacy of an alcohol preventive program for multi-ethnic urban youth (Komro et al., 2004; Komro et al., 2008). A cohort of youth enrolled in 61 public schools in Chicago participated in the study (29 schools assigned to the intervention, 32 to the comparison group) and completed self-report questionnaires when in 6th, 7th, and 8th. Four school-based surveys were conducted in 6th–8th grade (between 2002 and 2005). Details on the research design, sample characteristics, and measures can be found elsewhere (Komro et al., 2008). Parental consent and student assent procedures were approved by the University of Minnesota's Institutional Review Board for the Protection of Human Subjects and the Chicago Public Schools' Law Department. A Certificate of Confidentiality was obtained from the U.S. Department of Health and Human Services to further protect the confidentiality of the student responses.

Participants

The current study includes 5,812 adolescents who completed a survey at the beginning of 6th grade (mean age=11.84; 51% males) and at least one additional follow-up survey. The

majority of these participants lived in the U.S. their entire life (86%), lived in natural parent households (53%), and were from low-income families (77% received free or reduced-price lunch). The mean age at the end of 6th grade was 12.3 years ($sd=0.60$), 13.3 years in 7th grade ($sd=0.53$), and 14.3 years in 8th grade ($sd=0.46$). Of those present at baseline, 98% percent completed a survey at the end of 6th grade, 77% completed a survey at the end of 7th grade, and 70% completed a survey at the end of 8th grade. Table 1 provides summary statistics for the participants in this study.

Measures

Dependent Variable

Physical Aggression: A physical aggression index was created for each time point, including physical aggression at age 11 (baseline) and three additional repeated measures (6th, 7th, and 8th grade; ages 12 to 14). Four items were included: During the last month, how many times have you: (1) pushed, shoved, pulled someone's hair, or grabbed someone?; (2) kicked, hit, or beat up another person?; (3) taken part in a fight, where a group of your friends were against another group?; and (4) told someone you were going to hit or beat them up? Responses to each of these four items included: "Never," "1–3 times," and "4 or more times". Scores ranged from 0 to 8 (0 = "Never", 1 = "1 to 3 times", to 2 = "4 or more times") for each of the physical aggression behaviors. A higher score on this index indicates more frequent physical aggression behaviors. The standardized Cronbach's coefficient alpha of the physical aggression measure ranged from 0.60 to 0.75.

Neighborhood Characteristics

Neighborhood Problems: A neighborhood problems index was developed using seven items measured from parents' self-report data gathered at baseline. The items included: (1) "How much of a problem is drug dealing on your block?"; (2) "How much of a problem is unsupervised youth on your block?"; (3) "How much of a problem are people drinking alcohol on the street in your block?"; (4) How much of a problem is too many stores that sell alcohol on your block?"; (5) How much of a problem is the lack of supervised activities for youth on your block?"; (6) How much of a problem is too many alcohol ads on your block?"; and (7) How much of a problem is poor police response on your block?". Response options to each item included "Never", "1–3 times", or "4 or more times". Cronbach's coefficient alpha for this scale was 0.93.

Individual-Level Risk Factors—Individual-level risk factors included: alcohol use, peer alcohol use, lack of adult supervision, and depression.

Alcohol Use: Alcohol use was measured with one item: "During the last 12 months, on how many occasions, or times, have you had alcoholic beverages to drink?" Response options included "0 occasions", "1–2 occasions", "3–5 occasions", "6–9 occasions", "10–19 occasions", "20–39 occasions" and "40 or more occasions". Due to the skewed nature of the responses, this measure was dichotomized into "0" indicating "no alcohol use", and "1" indicating alcohol use in the past 12 months.

Peer Alcohol Use: Peer alcohol use was measured with one item: "How many of your friends drink alcohol?". Responses ranged from 0 to 4, including "None", "Few", "Some", "Many", and "Almost all".

Lack of Adult Supervision: Unsupervised time was assessed with one item: "About how many hours a day, do you usually spend without an adult around?" Responses included: "None", "< 1 h", "1–2 h", "3–4 h", and "5 or more hours".

Sad/Depressed: Sadness/depression was measured with one-item: “During the last month, how often have you felt sad or depressed?” Response values ranged from 1 to 3, and included “Never”, “1–3 times”, and “4 or more times”.

Demographics—Demographic variables included age, gender (1 = male, 0 = female), race/ethnicity, natural parent household, socioeconomic status, and youth’s nationality.

Race/Ethnicity: Race/ethnicity was characterized as Black, Hispanic, White, or Other based upon student self-report data at baseline. “Other” races were used as the reference group in all analyses.

Natural Parent Household: Family structure was assessed with one item: “Who do you live with most of the time?” Responses were coded as “Mother and Father together” vs. “Other”.

Socioeconomic Status: Receipt of free or reduced price lunch, an indicator of socioeconomic status, was assessed with one item: “Do you receive free or reduced-price lunches at school?” Responses were coded as “Yes = 1” versus “No or don’t know = 0”.

Nationality: Nationality was assessed with one item: “How long have you lived in the United States?” Responses were coded “All of your life = 1” versus “Foreign-born = 0”.

Analytical Strategy

Considering the nested structure of the PNC data (e.g., children within schools) it was necessary to use Hierarchical Linear Modeling (HLM) which enabled us to simultaneously estimate the between and within neighborhood differences in youths’ physical aggression over time (Raudenbush & Bryk, 2002). All of the hierarchical linear models were estimated with HLM version 6.0. The modeling process begins with an estimation of an unconditional model for each time period (end of 6th grade, end of 7th grade, and end of 8th grade), which allowed us to partition the variance between and within neighborhoods. Following the estimation of the unconditional model, an intraclass correlation () was calculated for each time period in order to evaluate the percentage of the variation in physical aggression that is between neighborhoods. After estimating the unconditional models, we then estimated a series of hierarchical linear models that introduced the individual-level risk factors and demographics into the model alongside the neighborhood characteristics in order to test whether individual-level risk factors and demographics can explain variation in physical aggression across neighborhoods in conjunction with or above and beyond neighborhood effects. These models are presented as unadjusted models and as models that are adjusted for baseline physical aggression.

Results

The hierarchical linear models displayed in Table 2 shows the effect of neighborhoods on physical aggression across neighborhoods. Over time, neighborhood problems significantly predicted physical aggression. Specifically, increasing reports of neighborhood problems was positively predictive of high physical aggression among adolescents residing within those neighborhoods in 6th ($b=0.03$; $SE=0.01$), 7th ($b=0.02$; $SE=0.01$), and 8th ($b=0.02$; $SE=0.01$) grades.

Table 3 depicts the effects of neighborhood problems on physical aggression after adjusting for individual-level risk factors, demographics, and baseline physical aggression. Neighborhood problems remained significantly predictive of physical aggression before

adjusting for baseline physical aggression at 6th ($b=0.02$; $SE=0.01$), 7th ($b=0.02$; $SE=0.01$), and 8th ($b=0.02$; $SE=0.01$) grades. Alcohol use was a significant predictor before adjusting for baseline physical aggression in 6th ($b=0.10$; $SE=0.03$) and 7th ($b=0.07$; $SE=0.04$) grades. Peer alcohol use was significant in all three waves before adjusting for baseline physical aggression; however, peer use was only significant in grades 6 ($b=0.05$; $SE=0.01$) and 8 ($b=0.04$; $SE=0.02$) after adjustment. Lack of adult supervision was positively related to physical aggression in all three grades before adjustment, and only in 6th grade ($b=0.02$; $SE=0.01$) after adjustment. Depression was highly predictive of physical aggression in all waves, even after adjustment for baseline physical aggression.

As expected, a number of demographic variables were significantly related to physical aggression. Before adjustment for baseline physical aggression, age was positively related to physical aggression in 6th ($b=0.08$; $SE=0.03$) and 7th grades ($b=0.08$; $SE=0.03$). However, these effects were not significant in the fully adjusted model. In the adjusted models, males were more likely to be physically aggressive in 6th ($b=0.07$; $SE=0.03$) and 8th ($b=0.07$; $SE=0.03$) grades. Adolescents born in the United States were also more likely to be physically aggressive compared to foreign-born adolescents in 6th grade only before and after adjustment of baseline physical aggression, and adolescents who reside in a two-parent home were protected from physical aggression in 6th ($b=-0.05$; $SE=0.02$) and 8th grades ($b=-0.07$; $SE=0.03$) after adjustment of baseline physical aggression. Finally, neighborhood problems no longer maintained a significant direct effect on physical aggression once the models were adjusted for baseline physical aggression, and this finding was observed in 6th, 7th, and 8th grade.

Discussion

The city of Chicago has been a location of extensive empirical inquiry into the etiology of delinquency, physical aggression, and violence at the neighborhood and individual level (Gibson et al., 2010; Hirschfield, 2009; Sampson, 1997; Shaw & McKay, 1969; Zagar et al., 2009). Relatively few studies have made an attempt to examine the influence of neighborhood-level and individual-level effects on physical aggression simultaneously and over time. In order to address this gap in the research, this study sought to examine the effect of neighborhood context and individual-level risk factors and demographics on physical aggression among a large sample of multi-ethnic urban at-risk Chicago youth who were participants in a group-based randomized controlled experiment.

Our findings suggested that some neighborhood characteristics have a significant influence on an adolescent's physical aggression such as neighborhood problems. Furthermore, the results of this study demonstrated that once individual-level risk factors and demographics were incorporated into the model, neighborhood characteristics (e.g., neighborhood problems) still maintained a direct effect on physical aggression. Finally, once the fully-specified hierarchical linear models were estimated, the results indicated that once the models were adjusted for baseline physical aggression the significant neighborhood effects were no longer observed. All of these findings were consistent over time (end of 6th grade, end of 7th grade, and end of 8th grade).

Overall, these findings tend to mirror those produced in prior multi-level studies that have shown that neighborhood-level processes typically only contribute 1% to 4% of the explained variance (Cheong & Raudenbush, 2000; Duncan & Raudenbush, 1999; Elliott et al., 1996; Simcha-Fagan & Schwartz, 1986). However, the direct effects that were observed in the unconditional models and in the models after incorporating the individual-level risk factors and demographics are relatively similar to other studies that have recently begun to

find more support for contextual effects ranging from a 6% to 7% increase in the variance explained (Anderson, 2002; Welsh et al., 1999).

Despite the consistent and relatively robust findings, it is necessary to acknowledge several limitations of the current study. First, although this study included a number of risk factors and with the understanding that risk factors can be reverse coded and considered protective factors, future research should make an effort to incorporate a greater number of risk factors as well as protective factors when such data is available. Second, this study relied on self-reported data on physical aggression from the at-risk youth directly and confined to one developmental period of the life course. While the longitudinal nature of this study is a considerable strength, it is important for future studies to gather data from multiple sources (parents, peers, teachers, direct observers, etc.) and to examine both official and self-reported physical aggression when possible. Finally, the current study did not assess how change in individual-level risk factors over time may affect physical aggression; rather, it examined how baseline risk influenced physical aggression over time. Future research is encouraged to examine both the static and dynamic nature of risk (and protective) factors on the development of physical aggression over multiple periods of the life-course (e.g., early childhood, adolescence, young adulthood, etc.).

Although the mechanism by which neighborhoods affect individual physical aggression is an ongoing area for future research, there are a number of implications that may apply from the findings of this current study. Programs targeting poor urban children during the preschool years have been shown to have a significant impact on reducing delinquent outcomes. For example, Head Start is one of the most well-known of these initiatives and evaluations (Darlington, Royce, Snipper, Murray, & Lazar, 1980; Lee, Brooks-Gunn, Schnur, & Liaw, 1990) have shown that the program was successful in producing short-term intellectual and social gains during the early preschool years, and Head Start youth were more likely to graduate from high school. Other programs such as the Perry Preschool Project, which involves early childhood education (ages 3 to 5), parent meetings, and home visits, has yielded a host of beneficial outcomes for program participants including better grades, higher standardized test scores, higher graduation and employment rates, and lower delinquency and arrest rates (Berreuta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984; Schweinhart & Weikart, 1988). In addition, programs implemented in the later elementary/early adolescent years specifically directed at improving problem-solving and social competency among poor urban youth have been associated with decreased levels of physical aggression and problem behaviors (Hawkins, Von Cleve, & Catalano, 1991; Lochman, Burch, Curry, & Lampron, 1984; Sarason & Sarason, 1981; Weissberg et al., 1981).

In addition, residential relocation programs, including the Moving to Opportunity for Fair Housing Demonstration (or MTO) and the Gautreaux Program, have been shown to produce positive outcomes in educational attainment and job opportunities among youth who moved to the suburbs (Rosenbaum, 1995; Rosenbaum & Popkin, 1991). Recent MTO evaluations have also indicated that residential relocation was significantly related to decreased involvement in violence, better overall health, and lower victimization rates (Katz, Kling, & Liebman, 2001; Ludwig, Duncan, & Hirschfield, 2001). Additionally, Leventhal and Brooks-Gunn (2003) have highlighted the significantly lower levels of depression, anxiety, and/or dependency problems among MTO youth when compared with youth who remained in the disadvantaged areas (Leventhal & Brooks-Gunn, 2003). Other initiatives that focus on increasing neighborhood supervision of teenage peer groups and promoting civic participation are likely to provide noticeable benefits as well (Sampson, 1997). Overall, these programs provide suggestions for how future research targeting disadvantaged youth

in disadvantaged neighborhoods can help to alleviate the conditions that negatively affect residents of these communities and reduce physical aggression.

Finally, considering that a number of individual-level risk factors had a significant effect on physical aggression, it is important that early interventions target these specific risk factors (e.g., alcohol use, peer influence, unstructured socializing, depression) in an effort to reduce physical aggression among urban at-risk youth. These early intervention strategies are often more effective than those that are employed after the adolescent has already demonstrated physically aggressive behavior (Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009). Ultimately, it is likely that the most effective interventions will address multiple causal factors, be carried out in multiple contexts, and be extended in time over the course of development. Families, peers, schools, and neighborhoods must work in concert to provide opportunities for children to learn prosocial behavior and to create environments where prosocial behavior is modeled and reinforced (Guerra, 1997, pp. 300–301).

It is important for researchers, policymakers, and individuals in general to be aware that all of the abovementioned elements do not operate in isolation from one another. Individual, family, peer, and neighborhood factors all influence developmental processes over the life-course. Sampson et al. (2002, p. 474) challenges neighborhood-level researchers to move beyond mere structural compositional measures of neighborhood effects and give greater attention toward understanding “cultural, normative, and collective action perspectives that attach meaning to how residents frame their commitment to places.” Spatial dynamics are also important to investigating the influence of neighborhoods on offending patterns. It is possible that while youth may reside in a disadvantaged area, they may spend more time in an adjacent neighborhood where there are stronger informal social ties and collective supervision of teenage peer groups. In the end, we hope that this research has taken an important step in answering the call for researchers to examine multi-level criminological research longitudinally (Sampson, 2006), and that future research continues to investigate the effects of neighborhood context and individual-level risk factors on physical aggression among urban at-risk youth.

Acknowledgments

This study was funded by grants from the National Institute on Alcohol Abuse and Alcoholism and the National Institute on Minority Health and Health Disparities (AA017480, AA013458, and AA016549). The authors thank Karen Alfano, MBA and Carolyn Kulb, B.A., for survey design and management of data collection, Kian Farbaksh, M.S., for database design and management, and Cheryl Perry, PhD, for her overall contributions to the PNC study. We gratefully acknowledge the participation of students and parents.

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Table 1

Baseline description (beginning of 6th grade) of neighborhood characteristics, individual-level risk factors, demographics, and physical aggression over time among urban Chicago youth

Variable (Baseline)	Mean	SD	Proportion	Min	Max
Neighborhood characteristics					
Neighborhood problems	20.17	4.20	—	11	28.08
Individual-level characteristics					
Risk factors					
Alcohol use	—	—	0.09	0	1
Peer alcohol use	0.49	0.88	—	0	4
Lack of adult supervision	1.70	1.43	—	0	4
Depression	1.01	0.75	—	0	2
Physical aggression (baseline)	2.63	2.38	—	0	8
Demographic controls					
Age	11.84	0.59	—	10.34	15.53
Male	—	—	0.51	0	1
Black	—	—	0.43	0	1
Hispanic	—	—	0.28	0	1
White	—	—	0.13	0	1
Other (reference category)	—	—	0.08	0	1
U.S. born	—	—	0.86	0	1
Natural parent household	—	—	0.53	0	1
Low socioeconomic status	—	—	0.77	0	1
Physical aggression					
End of 6th grade	3.01	2.50	—	0	8
End of 7th grade	3.33	2.44	—	0	8
End of 8th grade	3.33	2.49	—	0	8

Table 2

Hierarchical linear models assessing neighborhood effects on physical aggression (6th–8th grade)

	6th grade	7th grade	8th grade
	b (se)	b (se)	b (se)
Fixed effect			
Neighborhood characteristics			
Neighborhood problems	.03 (.01) **	.02 (.01) *	.02 (.01) *
Intercept	1.12 (.03) ***	1.23 (.03) ***	1.24 (.03) ***
Random effect			
Level 1 effect, r_{0j}	3.01	3.33	3.33
Variance component	.08	.05	.06
χ^2	925.08 ***	727.78 ***	748.46 ***
Intraclass correlation	.17	.16	.16

*
 $p < .05$ **
 $p < .01$ ***
 $p < .001$

Table 3

Hierarchical linear models assessing neighborhood effects and individual-level risk factors and demographics on physical aggression (6th–8th grade)

	6th grade		7th grade		8th grade	
	b (se) Unadjusted	b (se) Adjusted	b (se) Unadjusted	b (se) Adjusted	b (se) Unadjusted	b (se) Adjusted
Fixed effect						
Neighborhood characteristics						
Neighborhood problems	.02 (.01)*	.01 (.01)	.02 (.01)*	.01 (.01)	.02 (.01)*	.01 (.01)
Individual-level characteristics						
Risk factors						
Alcohol use	.10 (.03)***	-.01 (.03)	.07 (.04)*	.01 (.04)	.05 (.04)	-.01 (.04)
Peer alcohol use	.17 (.01)***	.05 (.01)***	.11 (.02)***	.03 (.02)	.11 (.02)***	.04 (.02)*
Lack of adult supervision	.04 (.01)***	.02 (.01)**	.02 (.01)*	.01 (.01)	.02 (.01)*	.01 (.01)
Depression	.15 (.02)***	.06 (.02)**	.14 (.02)***	.08 (.02)***	.11 (.02)***	.06 (.02)**
Physical aggression (baseline)	—	.16 (.01)***	—	.11 (.02)***	—	.09 (.01)***
Demographic controls						
Age	.08 (.03)**	.03 (.02)	.08 (.03)**	.04 (.04)	.02 (.03)	-.01 (.03)
Male	.16 (.03)***	.07 (.03)*	.09 (.03)**	.03 (.03)	.11 (.03)**	.07 (.03)*
Black	.01 (.05)	.02 (.05)	-.01 (.05)	-.01 (.05)	.01 (.05)	.01 (.05)
Hispanic	-.06 (.04)	-.05 (.04)	-.03 (.04)	-.03 (.05)	-.02 (.04)	-.02 (.04)
White	-.11 (.06)*	-.07 (.05)	-.05 (.05)	-.04 (.06)	-.07 (.05)	-.07 (.05)
U.S. born	.10 (.04)*	.08 (.03)*	.06 (.04)	.03 (.04)	.04 (.04)	.02 (.04)
Natural parent household	-.08 (.02)**	-.05 (.02)*	-.06 (.02)*	-.04 (.03)	-.09 (.03)**	-.07 (.03)*
Low socioeconomic status	-.01 (.03)	.01 (.03)	.02 (.03)	.01 (.03)	.01 (.03)	.01 (.03)
Intercept	1.10 (.03)***	1.22 (.03)***	1.24 (.03)***	1.20 (.03)***	1.25 (.03)***	1.22 (.03)***
Random effect						
Level 1 effect, τ_{0j}	3.01	3.01	3.33	3.01	3.33	3.33
Variance component	.05	.02	.04	.02	.04	.03
²	467.83***	250.85***	406.16***	297.89***	391.95***	274.82***
Intraclass correlation	.10	.05	.14	.10	.14	.09

The first columns represent the unadjusted effects and the second columns represent the effects adjusted for baseline physical aggression

*
 $p<.05$
**
 $p<.01$

 $p<.001$