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Original article

The Role of Neighborhood Income Inequality in Adolescent Aggression and Violence

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 A B S T R A C T

Purpose: Being a perpetrator or victim of assaults can have detrimental effects on the development and health of adolescents. Area-level income inequality has been suggested to be associated with crime and aggressive behavior. However, most prior research on this association has been ecological. Therefore, the purpose of this investigation was to describe the association between neighborhood-level income inequality and aggression and violence outcomes.

Methods: Data were collected from a sample of 1,878 adolescents living in 38 neighborhoods participating in the 2008 Boston Youth Survey. We used multilevel logistic regression models to estimate the association between neighborhood income inequality and attacking someone with a weapon, being attacked by someone with a weapon, being physically assaulted, being shown a gun by someone in the neighborhood, shot at by someone in the neighborhood, witnessing someone getting murdered in the past year, and having a close family member or friend murdered. Race and income inequality cross-level interactions were tested. Analyses were stratified by sex.

Results: Among nonblack boys, after adjusting for nativity, age, neighborhood-level income, crime, disorder, and proportion of the neighborhood that is black, income inequality was associated with an increased risk for committing acts of aggression and being a victim of violence. Among nonblack girls, those living in neighborhoods with high-income inequality were more likely to witness someone die a violent death in the previous year, in comparison to those in more equal neighborhoods.

Conclusions: Income inequality appears to be related to aggression and victimization outcomes among nonblack adolescents living in Boston.

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 IMPLICATIONS AND CONTRIBUTION

Among nonblack adolescents, living in neighborhoods with high-income inequality is associated with an increased likelihood of experiencing aggression and violence outcomes, compared with those living in neighborhoods with low- or moderate-income inequality.

Aggressive acts and violent crimes such as assaults, shootings, and homicides have been consistently shown to have detrimental effects on children and youth and are therefore a public health concern [1,2]. Among children aged 2–17 years in a U.S. national sample, more than one half had experienced a physical assault

[3]. Only 29% reported experiencing no victimization of violence [3]. Recent evidence has identified associations between exposure to violence and adverse outcomes such as psychological distress, anxiety, and high blood pressure [4]. The consequences of stress can include maladaptive coping behaviors, such as smoking [5,6] and alcohol consumption [5–7], and marijuana use [6–9]. The burden of aggression and violence in the community is often concentrated in disadvantaged and predominantly minority schools and communities that are more likely to be racially and socioeconomically segregated in U.S. society [10,11].

Environmental characteristics, such as the distribution of income in society, have also been hypothesized to influence

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aggressive and violent behavior [12–16]. For example, violent crime is thought of being a reflection of the quality of the social environment [14]. Violent crime rates, such as homicide, assault, and robbery, have been shown to be robustly associated with income inequality [14]. Income inequality has been shown to be associated with homicide rates among those aged 15–24 years [16]. With the exception of one study that identified higher levels of income inequality being associated with more frequent bullying among both males and females [17], most research that investigates the relationship between income inequality and aggression and violence outcomes has been ecological. As a result, findings might actually be spurious because of the ecological fallacy [14]. Ecological fallacy, or aggregation bias, has been defined as “the bias that may occur because an association observed between variables on an aggregate level does not necessarily represent the association that exists at an individual level” [18].

One mechanism proposed that might explain the relationship between income inequality and aggression is that when the gap between rich and poor within a society increases, this is accompanied by an erosion of social cohesion is thought to occur [15]. Lower social cohesion is in turn reflected by declining levels of trust in society, as well as the social exclusion of those who are left behind. According to Merton’s social strain theory [19], when legitimate channels of upward social mobility are denied to individuals, they may seek alternate means of achieving social status and success, such as engaging in the illegal economy. This mechanism, combined with a sense of frustration and anomie, can find expression in increased acts of violence and aggression [14,15].

Previous research has indicated that there are gender differences in the likelihood of both being exposed to violence and being perpetrators of aggressive behavior [20,21]. Furthermore, researchers have observed that area-level socioeconomic characteristics might be related differently among males and females [22,23]. Therefore, females and males might react to income inequality in different ways.

The objective of this investigation was to examine the relationship among an ethnically diverse sample of urban youth, aged 13–19 years, attending high school, between neighborhood-level income inequality and aggressive and violent outcomes that include witnessing, perpetrating, and being a victim of violence. We also investigated whether neighborhood-level income inequality and aggression is explained by low social cohesion. This study improves on previous ecological studies of income inequality and aggression, which may be limited by the ecological fallacy.

Methods

For this investigation, we used data from the 2008 *Boston Youth Survey* (BYS), a biennial survey of high school students (grades 9–12) in Boston Public Schools, which have been described elsewhere [24,25]. Briefly, a two-stage, stratified, random-sampling strategy was used and has been described elsewhere [25,26]. First, we invited all 32 secondary schools in the Boston public school system. Twenty-two of the eligible schools agreed to participate. Second, these 22 schools then provided a list of classrooms stratified by grade, from which we randomly selected classrooms. The final sample of students was representative of students in Boston public high schools [26].

The BYS study staff developed the questionnaire, which covered topics such as health behaviors, indicators of positive youth development, with an emphasis on violence exposure [27]. The paper-and-pencil survey, which was pilot tested and which included a number of scales with demonstrated validity and reliability, was administered in classrooms in the spring of 2008 [27]. Opt-out consent was sought from students’ parents before survey administration, that is, parents were asked to indicate if they did not want their children to participate in the BYS. The purpose of the survey was read aloud to the students by survey administrators, and at that time, students were also free to not fill out the survey if they did not wish to participate. Of the students selected ($n = 2,725$), 69% completed surveys ($n = 1,878$). The office of Human Research Administration at the Harvard School of Public Health approved all procedures for the BYS.

Study variables

Seven aggression and exposure to violence outcome variables were used. Respondents were asked in the past 30 days if they had *attacked someone with a weapon other than a gun, like a bat, bottle, chain or knife?* Response options were *Never, 1–2 times, 3 or more times*, which were dichotomized to no versus yes. To determine if participants had been victimized, participants were asked: *in the past 12 months, you got punched with a fist, kicked, choked, or beaten up by anybody; you got attacked or threatened with a weapon other than a gun, like a bat, bottle, chain, or knife; someone showed you they had a gun to scare you or get you to do something (do not include a toy gun); you were shot at or shot with a gun (do not include a toy gun); respectively.* Response options were *yes or no*. Students were also asked about witnessing violence with the following items: *if they had seen somebody get killed by violence like being shot, stabbed or beaten to death? Yes or no*. Finally, students were asked about personal loss with the item: *in your entire lifetime, have any close family friends of yours been killed by violence, like being shot, stabbed, or beaten to death? (Do not include those killed in war.)* Response options were *yes or no*.

Covariates included in the study were students’ age, nativity, (U.S. born, foreign born arrived ≤ 4 years, and foreign born arrived >4 years), and race or ethnicity (black vs. nonblack).

Participants provided the nearest cross street of their residence for geocoding to U.S. Census tracts. Data from the U.S. Census American Community Survey in 2008 were used to characterize neighborhood clusters of Census tracts; these neighborhood clusters were formed by working with key informants from across the city of Boston to identify 38 socially meaningful neighborhood clusters. A socioeconomic score, economic deprivation, was created using principal component analysis. A higher score was indicative of greater economic deprivation. U.S. Census indicators included in this score were the proportion of residents living below poverty level, proportion of households receiving public assistance, and proportion of families with a female head of household (Cronbach $\alpha = .84$). Tertiles of the neighborhood economic deprivation score were used to categorize neighborhood-level economic deprivation into low, moderate, and high. The proportion of the residential neighborhood that is black was categorized into low ($<33\%$), moderate ($33\%–66\%$), and high ($>66\%$) as well.

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