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Neighborhood Violence and Urban Youth

Anna Aizer

9.1 Introduction

In a 1997 survey nearly three quarters of American children reported having been exposed to neighborhood violence (Hill and Jones 1997; Boney-McCoy and Finkelhor 1996). These rates are highest among low-income urban youth. There have been numerous studies of the impact of exposure to violence on children that have linked exposure to violence with restricted emotional development, aggressive behavior, depression, anxiety, sleep disturbances, learning problems, and truancy.

However, the existing literature on neighborhood violence is characterized by a number of shortcomings. In a review of the literature, psychiatrist Joy Osofsky identifies a number of these shortcomings and calls for future research to address them.[1] One shortcoming relates to the difficulty defining or characterizing neighborhood violence, which leads to significant measurement error. Another is the fact that neighborhood violence is often correlated with high rates of domestic violence and other types of disadvantage (racial, income, and parental education) which in turn have been shown to have deleterious effects on child outcomes.[2] As such, research documenting

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1. Osofsky (1999).

2. Research conducted in the early 1990s concluded that three to ten million children witness assaults against a parent by an intimate partner each year (Straus 1992). More recent work has

a relationship between neighborhood violence and poor child outcomes may overstate the relationship.

In this chapter we seek to answer the following questions: (a) In what other ways do violent neighborhoods differ from non-violent ones? (b) Who is exposed to neighborhood violence? Is exposure to violence random? and (c) Does exposure to violence affect child outcomes or does it reflect other poor circumstances or types of disadvantage?

This research contributes to the existing body of work on the impact of exposure to violence on child outcomes by examining this issue with new data that is well-suited to address many of the shortcomings of the existing work. Importantly, we use established econometric techniques (referred to as neighborhood and family fixed effects) that allow one to control for both observed and unobserved measures of neighborhood and family disadvantage that might be correlated with both exposure to violence and poor child outcomes, thereby enabling causal inference. The data come from the Los Angeles Family and Neighborhood Study (LA FANS), an individual survey of children and their families residing in sixty-five neighborhoods in Los Angeles, California. The survey contains information on child and parent characteristics including exposure to violence and association with violent peers as well as family characteristics and multiple measures of child well-being. Because all the children in the sample reside in one county, they are subject to the same macroeconomic conditions and government programs so that we can implicitly control for differences along these dimensions and focus on the impact of neighborhood differences on child well-being.

In addition, we utilize alternative measures of community or neighborhood violence. Typically, measures of neighborhood violence consist of police or crime reports available only at an aggregate level (such as the county or city) that is not truly representative of a child's neighborhood. In addition, they do not necessarily reflect true violence or victimization but rather a combination of underlying violence and police response to that violence. Instead, we use two alternative measures of violence designed to overcome these shortcomings. The first is the rate of hospitalizations for assault developed from California Hospital Discharge data, which is an administrative database consisting of all hospitalizations in the state. These data allow one to create measures of violence at the zip code (which is more local than the county or city) that are not subject to recall or self-reporting bias and do not reflect policing policies. The second source of data on neighborhood violence is based on police data for individual reporting districts in LA City. While these data are generated by the LA Police Department and therefore reflect both underlying violence and police reports, the data are

found that violence against pregnant women (most often perpetrated by an intimate partner) has a negative and significant impact on birth outcomes, which have been linked to worse economic outcomes later in life (Aizer 2007).

available at a very fine level of detail (the census tract) and therefore more closely approximate one's immediate neighborhood—even more so than a zip code.

Combining the individual level data from the LA FANS survey with measures of neighborhood violence and other neighborhood characteristics from the 2000 Census yields a data set with a wide range of information on child, family, and neighborhood characteristics. These data enable one to explore both the effects of exposure to violence on child well-being and how individual, family, and neighborhood characteristics affect one's exposure to violence. In addition, we employ econometric techniques, referred to as "fixed effects," (described in greater detail later) that allow us to control for underlying disadvantage at the neighborhood and family level that is unobserved by the researcher. In so doing, we can isolate the causal impact of exposure to violence, separate from underlying family and neighborhood disadvantage, on child outcomes. This research will help us to better understand the role of violence in the lives of disadvantaged children. It should be stressed that the focus of this work is estimating the impact of intermittent exposure to neighborhood violence on child outcomes. As such, these results are not generalizable to children who are the victims of repeated victimization such as child abuse.[3]

9.2 Literature Review

There have been numerous studies of the impact of exposure to violence on children, with most of the research conducted by psychologists, psychiatrists, and social workers. This research has linked exposure to violence with restricted emotional development, aggressive behavior, depression, anxiety, sleep disturbances, learning problems, and truancy.[4]

The earliest studies focused on single nonrecurring acts of violence such as sniper shootings in school playgrounds (Pynoos et al. 1987). These studies generally found posttraumatic stress symptom responses related to internalizing problems (anxiety and depression) that varied with proximity to the actual violence. However, it has since been noted that the clinicians in these studies were not blind to the subjects' exposure to violence, which some believe may have biased the findings (Cooley-Quille et al. 1995).

More recently, researchers have focused on exposure to chronic community violence. These studies have, in general, linked exposure to community violence to externalizing behavioral problems (Bell and Jenkins 1993). For example, in a study of thirty-seven school children age seven through twelve, Cooley-Quille et al. (1995) found that exposure to high levels of

3. For example, recent work by Currie and Tekin (2006) suggests that repeated child abuse and maltreatment leads to large and significant reductions in child well-being.

4. Fonagy, Target, Steele, and Steele 1997; Gorman-Smith and Tolan 1998; Jenkins 1995; Loeber et al. 1993; Schwab-Stone et al. 1995.

community violence was not related to internalizing behavior and disorders, but was associated with externalizing behavior problems, restlessness, and impaired social and behavioral functioning. However, the authors also note that "families of children with high exposure to community violence were characterized by high conflict and lack of cohesiveness." This leads the authors to conclude that "An important caution is needed in interpreting the relationship between exposure to violence and behavior problems. Because of the study's correlational nature, it cannot be determined whether one variable causes the other or whether both are mediated by a third factor" (1365).

In another (larger) survey of 2,248 sixth, eighth, and tenth graders in an urban public school system, Schwab-Stone et al. (1995) find that 40 percent of youth reported exposure to a shooting or a stabbing in the past year. Children exposed to high levels of violence were more likely to be black and/or Latino and more likely to receive free lunch. Using one-way Analysis of variance (ANOVA) to examine differences in child outcomes, they found that violence exposure was associated with greater willingness to use physical aggression, diminished perception of risk, lowered personal expectations for the future, dysphoric mood, antisocial activity, alcohol use, and diminished academic achievement. However, in their discussion, the authors also acknowledge the difficulty establishing a causal relationship, writing, "from the current study one cannot say that violence exposure or feeling unsafe causes any of the attitudes or aspects of adaptation that are significantly related, statistically speaking, to them" (1366).

Few economists have studied the impact of exposure to violence on child outcomes. The little work that does exist explicitly recognizes the difficulty of making causal inference, as exposure to violence may be correlated with other sources of disadvantage that may be responsible for the poor outcomes observed. Grogger (1998) estimates the impact of school violence on high school graduation rates based on a large survey of school children and their school administrators. School violence can affect graduation rates by reducing school attendance and/or the ability to concentrate when in school, thereby lowering the probability of graduation. A major problem estimating the impact of school violence on outcomes is that more violent schools may have lower graduation rates simply because violent students are less likely to complete high school. Grogger overcomes this problem by focusing on the high school graduation rates of nonviolent students. He finds that higher rates of school violence as reported by principals among one's peers was related to lower rates of graduation among the *nonviolent* students.

But it may still be the case that nonviolent children in violent schools differ in important ways from nonviolent children in nonviolent schools. Violent schools are more likely to be in poorer neighborhoods and parents who send their children to violent schools may suffer from other forms of disadvantage relative to parents who send their children to nonviolent schools. It

may be these differences, not differences in school violence per se, that are responsible for these differences.

More recent work by Kling, Liebman, and Katz (2004) and Ludwig, Duncan, and Hirschfield (2001) based on the Moving to Opportunity (MTO) demonstration provides experimental evidence of the impact of neighborhoods on child well-being. In the MTO study, poor families were randomly selected to receive subsidies to move to higher income neighborhoods. The MTO study overcomes previous difficulties estimating the impact of environment on child well-being—because of the random assignment, families living in poor and nonpoor neighborhoods will not differ in significant ways. The analysis consisted of in-depth interviews with families followed by a quantitative analysis of how moving to a higher income neighborhood affected child outcomes. In the qualitative analysis, the authors found that fear of random violence caused parents to focus much of their time and energy on keeping their children safe and that parental monitoring declined when they moved to higher income neighborhoods.

In the quantitative analysis that followed, the authors found a positive and significant impact of moving to a higher income neighborhood on girls but no impact on boys (Kling and Liebman 2005). Females experienced improvements in education and mental health and were less likely to engage in risky behaviors. While the focus of the MTO study is to evaluate the impact of poor neighborhoods (and not violence specifically) on child outcomes, the authors find that families that move to higher income neighborhoods report lower rates of victimization, especially for females, but the reductions are not statistically significant. There are, however, significant differences between poor and nonpoor neighborhoods in the quality of the school environments, the presence of adult role models, and the health of the environment. Thus, while the qualitative analysis suggested that safety and lack of fear of random violence would explain improved outcomes associated with moving to a higher income neighborhood, the quantitative evidence does not appear to support this.

Finally, recent work by Ludwig and Kling (2007) investigates whether the findings of Ludwig, Duncan, and Hirschfield (2001)—that moving to a lower-poverty neighborhood reduces violent criminal behavior among youths—can be explained by reductions in exposure to criminal activity as measured by neighborhood crime rates. Ludwig and Kling (2007) find no support for the hypothesis that crime is "contagious." Rather, they find that neighborhood racial segregation appears to be a much more important factor than neighborhood crime rates in explaining youth crime. Although the focus of their work is criminal activity, crime and violence are highly correlated and these results provide further suggestive evidence that exposure to neighborhood violence may not have a strong causal impact on youth behavior or outcomes but that the underlying level of neighborhood disadvantage may be more important.

Thus, the existing literature on the impact of violence on child well-being appears to be mixed. While work by psychiatrists and psychologists has found an association between exposure to community violence and externalizing behavioral problems, there is also evidence that children exposed to more community violence are disadvantaged in other respects—they are poorer, more likely to be black, and their families suffer from "lack of cohesiveness." As such, it is difficult to make causal inferences regarding the relationship between exposure to violence and child well-being. Work by economists that has sought to overcome this difficulty through randomized assignment to neighborhood has found that moving out of poor neighborhoods does improve outcomes for girls, but cannot attribute the improvements to reductions in violence. In addition, they have found that the reductions in criminal activity associated with moving to a lower poverty neighborhood are not attributable to reductions in neighborhood crime but are more likely explained by improvements in other measures of neighborhood disadvantage—racial and income segregation (Ludwig and Kling 2007).

In the work presented here, we attempt to distinguish the impact of violence from other forms of disadvantage. In other words, we attempt to answer the question: does exposure to community violence cause child outcomes to worsen? Or rather, is it the case that disadvantaged youth are exposed to more violence, and it is the underlying disadvantage, not the violence, that is responsible for the worse child outcomes? We proceed in two stages. First, we include multiple controls for neighborhood and family disadvantage that are available in the data. Second, we employ neighborhood and family "fixed effects," which enable us to control for forms of neighborhood and family disadvantage that may be correlated with exposure to violence but not captured in the data. This method is described in greater detail in section 9.6.

9.3 Data

9.3.1 The Los Angeles Family and Neighborhood Study (LA FANS)

The LA FANS is a panel study of a representative sample of all neighborhoods in Los Angeles. Poor neighborhoods and children are oversampled and all analyses presented here are weighted using the survey weights, which are designed to provide estimates generalizable to the population of all children living in Los Angeles. While the survey is designed as a panel, only data for the first wave (conducted in 1999 to 2000) are currently available. In wave 1, an average of forty-one households within each neighborhood were randomly selected for interview. Sampled adults were asked questions about household economic status, health insurance, participation in welfare programs, and use of social services, as well as questions about their neigh-

borhoods. Caregivers provided information on the home environment, children's behavioral problems, and school performance. Cognitive assessments were administered to children over three. Children older than nine were also asked about exposure to violence, their friends, and social interaction; as such, the analysis sample is limited to this older group of 785 children.

To compare the analysis sample with the overall population of children in the United States, we present descriptive statistics for this sample and for the sample of children living in Los Angeles and the nation from the 2000 Census in table 9.1. In column (1) are the unweighted means for the LA FANS sample; column (2) contains the weighted means. In column (3) are population means for families with at least one child between the ages often and nineteen in LA county from the 2000 Census and in column (4) are means for the entire U.S. population of families with at least one child between ten and nineteen.

The children included in this analysis are, on average, fifteen years old. Thirty six percent of mothers are high school dropouts, 67 percent are married, and 34 percent live below poverty. Eleven percent of the mothers receive cash welfare benefits. Given that the survey was conducted in Los Angeles, it is not surprising that 55 percent are Hispanic, 10 percent black, 27 percent white, and 8 percent Asian. If we compare the raw means in column (1)

Table 9.1 Comparison of LA FANS with 2000 Census

	LA FANS—Unweighted	LA FANS—Weighted	Census—LA county	Census—United States
Family/Child characteristics				
Maternal education (years)	11.99	12.37	11.14	12.77
Mother < high school	0.36	0.32	0.39	0.16
Black	0.10	0.12	0.08	0.11
Hispanic	0.55	0.51	0.49	0.12
White	0.27	0.27	0.34	0.65
Asian	0.08	0.11	0.14	0.04
Married	0.67	0.68	0.77	0.69
Family earnings (in thousands)	43.53	46.62	47.87	52.57
Below poverty	0.34	0.29	0.19	0.13
Welfare participation	0.11	0.11	0.09	0.04
SSI receipt	0.04	0.04	0.01	0.02
Maternal age	42.4	41.8	41.37	40.90
Child age	15.1	15.1	14.11	14.21
Male	0.51	0.51	0.51	0.51
Number of siblings	1.32	1.43	1.83	1.45
Violence measures				
Know gang members	0.21	0.20		
Witnessed shooting in past year	0.08	0.06		
Robbed in past year	0.11	0.11		
Family often hits	0.18	0.17		

with the weighted means in column (2), we see that when we weight the sample means, the children appear slightly less disadvantaged. When we compare the weighted means to those from the 2000 Census, we conclude that the LA FANS sample is slightly more disadvantaged relative to the LA county population (column [3]) in terms of race (LA FANS is more likely to include black and Hispanic children) as well as poverty (LA FANs includes more poor families and families that rely on welfare or Supplemental Security Income [SSI]). However, when we compare the average characteristics of children sampled in the LA FANS with those in the nation more generally, we find that the LA FANS children are much more disadvantaged in terms of income, race, and maternal education (column [4]). The fact that the analyses are based on a disadvantaged (and nonrepresentative) population of children should be taken into account when interpreting the results.

Exposure to violence in this sample is somewhat common. Twenty one percent of children in this sample report having violent peers as measured by whether they know a gang member (girls are as likely to report violent peers as boys in this sample). As for exposure to street violence, 11 percent reported being robbed and 8 percent witnessed a shooting in the past year.[5]

9.3.2 California Hospital Discharge Data

The LA FANS data, which contain the household census tract, are merged with measures of neighborhood violence developed from California's hospital discharge database. The hospital data is available at the zip code level. As such, for analyses involving these data, the child's neighborhood is defined as the zip code in which he or she lives. A zip code(s) is a far more precise measure of one's neighborhood than measures typically used (cities or counties) for the purpose of measuring neighborhood violence. Information on the number of individuals in each zip code (to compute an assault rate) as well as characteristics of the zip code (poverty rate, racial composition, share low skilled, etc.) comes from the 2000 Census. There is considerable variation in the number and rate of admissions for assault across LA's neighborhoods. For example, in South Central Los Angeles there were 501 admissions for assaults among those age fifteen to forty-four in 2000 (or forty-five per 10,000). In Compton there were 213 admissions (thirty-six per 10,000) and in Beverly Hills there were five (three per 10,000).[6]

The main advantage of using hospital discharge data to calculate measures of neighborhood violence is that it enables one to calculate much

5. Eighteen percent report exposure to family violence, as measured by reports of family members "often hitting." However, the characteristics of the families of children who report family violence differ considerably from the characteristics of violent families reported in other data, suggesting that this measure may be unreliable in the LA FANS. For this reason, we do not use this measure in the analysis. However, when we conduct the family fixed effect analysis (described later) we implicitly control for measures of domestic violence.

6. South Central includes zip codes 90001, 90002, 90003, 90047, and 90059; Compton 90220, 90221, and 90222; and Beverly Hills includes zip codes 90210, 90211, and 90212.

more local measures than other data sets and does not rely on self-reports or police reports.[7] In addition, the measures can be broken down by race and whether the violence involved a gun. But there are potential drawbacks to these data. First, they capture extreme acts of violence (though they are likely highly correlated with less severe violence). Second, because they are based on hospital utilization, they may capture violence perpetrated against those most likely to rely on hospitals as a source of medical care (those with fewer resources or those located closest to hospitals). However, the measure is based only on admission to the hospital, not emergency department utilization, and as there is less discretion in hospital admission, we believe that the potential for this measure to capture poverty is minimal and that it fairly accurately captures neighborhood violence. But in a conservative effort to limit any potential for bias we recalculate our measure of neighborhood violence not as a rate of assaults, but as the share of all hospitalizations for an injury that are due to assaults. The latter implicitly controls for greater reliance on hospitals for care in some zip codes relative to others.

9.3.3 Violent Crime by Census Tract for LA City

We can link information on violent crime by census tract (a smaller area than zip code) to the roughly 475 youth surveyed as part of the LA FANS and who reside in LA City (a subset of LA County). These data were first compiled by Grogger (2002).[8] As noted previously, while these data are based on police reports and thus capture not only violence but reports to the police, they are available at the finest level of detail possible—the census tract that includes on average 5,800 individuals in LA county, as opposed to a zip code that includes on average 67,000 individuals. These data are not available by race or age. Rates of violent crime for the year 1999 range from 0 to 1,910 per 10,000, with an average of 136, which is considerably lower than it was in the early 1990s. In 1992, the first year for which these data are available, the average rate of violent crime per census tract in Los Angeles was 275 per 10,000, representing a 50 percent decline in violent crime over an eight-year period.

The next three sections contain our analysis of the role of violence in the lives of urban youth. In the next section (section 9.4), we seek to answer the first of the three questions: in what other ways do violent neighborhoods differ from nonviolent ones? In section 9.5, we answer the second set of questions: who is exposed to neighborhood violence? Is exposure to violence

7. Calculations by the author based on the National Crime Victimization Survey (NCVS) of 2004 reveal that the vast majority of violent crime occurs near the victim's home. For example, among those age twelve to nineteen who were victim of an assault, 15 percent reported that the assault happened in or very near the home, 47.7 percent reported that it happened within one mile, and 76.2 percent reported that it occurred within five miles. This suggests that assault rates calculated from hospital discharge data that identify the patient's zip code of residence do accurately reflect violence in the zip code.

8. The data were subsequently updated by George Tita.

random or correlated with other forms of family disadvantage? Finally, in section 9.6, we answer the last of our three questions, does exposure to violence affect child outcomes or does it reflect other poor circumstances or types of disadvantage?

9.4 How Do Violent Neighborhoods Differ from Nonviolent Ones?

Our first measure of neighborhood violence is the share of all hospitalizations for an injury in a zip code that are the result of an assault. This measure should reduce, if not eliminate, any bias in the measures of violence that derives from one group's greater reliance on hospitals for care.[9] We also decompose the assault rate into gun and nongun assaults.

In figure 9.1 we present graphic evidence of a relationship between this measure of community violence and various community characteristics. As is evident from all graphs, there is a positive correlation between neighborhood violence among youths (those aged fifteen to nineteen) and neighborhood measures of disadvantage. Zip codes with higher levels of violence have a greater share of high school dropouts, individuals below poverty, households receiving welfare, black individuals, and a higher unemployment rate. These relationships persist for adults (age twenty-five to forty-four) as well.

The two most important predictors of violence are the share below poverty and the share black in a neighborhood. Among youths, if the share below poverty increases by a standard deviation (.104) then the assault rate (as a ratio) increases 15 percent of a standard deviation. If the share black increases by a standard deviation, then violence increases by 28 percent of a standard deviation. Among adults, poverty appears to have a greater impact than race in predicting violence.

In figures 9.2 and 9.3 the rates are decomposed into gun-related assaults and non-gun-related assaults, respectively. In Los Angeles, among those age fifteen to nineteen, gun violence is responsible for a large share of hospital admissions: 12 percent of all hospital admissions for an injury and 61 percent of all hospital admissions for an assault. As is evident from figures 9.2 and 9.3, the relationship between violence and neighborhood disadvantage is driven almost entirely by gun violence, and, as with the total assault rate, the share below poverty and the share black appear to be the most important predictors of neighborhood violence.

In figure 9.4 we present results from a similar exercise based on census tracts in LA City. The findings are similar: race (share black) is highly correlated with violent crime at the census tract level, as are the share receiving welfare and the share below poverty. Unlike the hospitalization data, the

9. Results based on the assault rate are very similar but tend to yield more "outlier" observations.

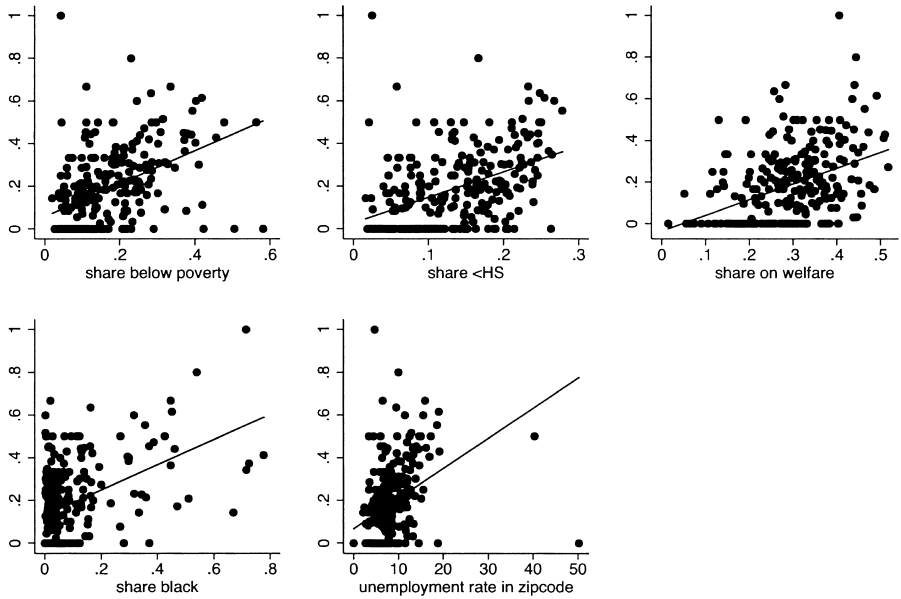

Fig. 9.1 Neighborhood characteristics and assaults / total injuries

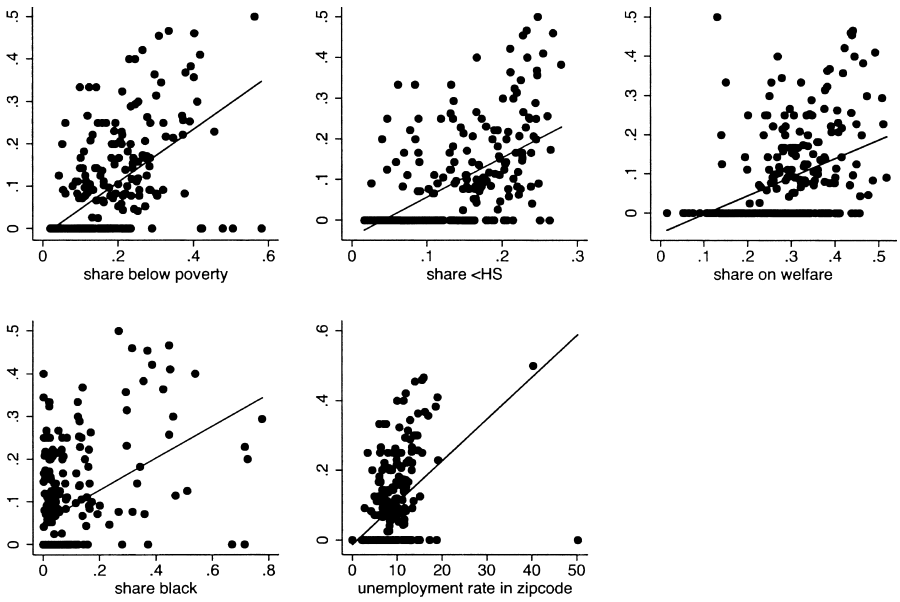

Fig. 9.2 Neighborhood characteristics and gun assaults / total injuries

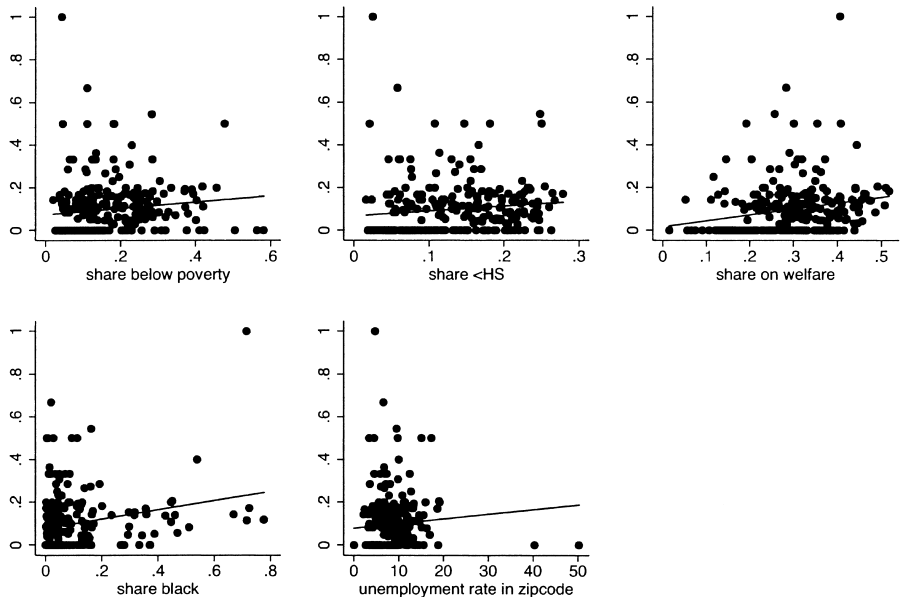

Fig. 9.3 Neighborhood characteristics and non-gun assaults / total injuries

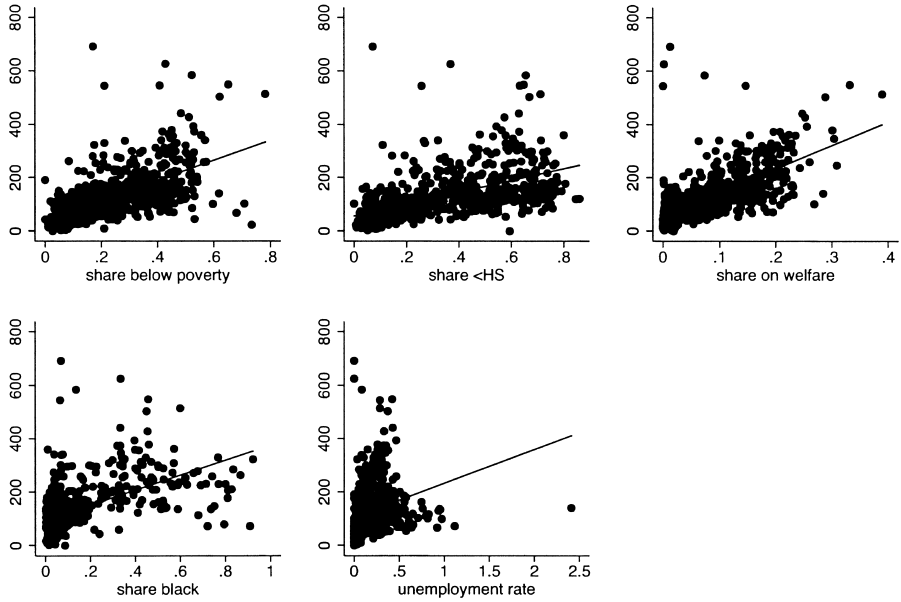

Fig. 9.4 Neighborhood characteristics and violent crime

crime data do not allow us to look at gun versus nongun crimes or differences by age.

Overall, this preliminary analysis based on aggregate data suggests that community violence (and gun violence, in particular) is correlated with multiple measures of disadvantage. This will affect our ability to attribute any negative relationship that we observe between violence and child well-being to violence and not the underlying disadvantage without adequately controlling for underlying sources of disadvantage.

9.5 Who Is Exposed to Violence? Are Children from Disadvantaged Families Exposed to More Violence?

What determines personal exposure to violence? Is living in a violent neighborhood the most important factor? How much do family characteristics matter? We begin to answer these questions by comparing hospitalization rates across races and age groups. In table 9.2 we see that hospitalization for assault is more common among youths age fifteen to nineteen than adults (age twenty-five to forty-four) and children (age zero to fifteen, not shown). The decline in violence by age is even more striking when we focus on gun violence (column [3]). In addition, blacks have much higher rates of assault than other groups: nearly 4 per 1,000 compared to .5 per 1,000 for whites and 1.4 for Hispanics. This is particularly true for gun assaults (column [3]). But the higher rates for blacks reflect, in part, their greater reliance on hospitals for care. In column (2) of table 9.2 we present the share of all hospitalizations for an injury that are the result of an assault, and in columns (4) and (5) the share of all hospitals for an assault and any injury that are the results of a

Table 9.2 **Hospitalization for assaults by race and age—LA county 2000**

	Assaults per 1,000	Assaults/ Total injuries	Gun assaults per 1,000	Gun assaults/ Total injuries	Gun assaults/ Total assaults	Population
			Age 15–19			
White	0.456	0.083	0.167	0.07	0.366	179,725
Black	3.913	0.415	3.203	0.267	0.819	70,533
Hispanic	1.390	0.270	0.889	0.147	0.639	390,588
Asian	0.374	0.131	0.054	0.025	0.144	85,587
Other	0.081	0.217	0.035	0.097	0.433	222,698
Total	1.002	0.221	0.649	0.119	0.647	949,131
			Age 25–44			
White	0.323	0.055	0.064	0.006	0.198	1,098,897
Black	2.638	0.262	1.077	0.077	0.408	307,807
Hispanic	0.698	0.150	0.226	0.042	0.324	1,551,054
Asian	0.133	0.063	0.023	0.009	0.172	419,679
Other	0.037	0.100	0.004	0.013	0.108	839,816
Total	0.554	0.115	0.180	0.027	0.325	4,217,253

Table 9.3 **Personal exposure to violence conditional on neighborhood violence and maternal vigilance**

			All neighborhoods	
	Nonviolent neighborhood	Violent neighborhood	Mother knows	Mother not know
Know gang member	0.16	0.23	0.126	0.18
Family hits	0.18	0.22	0.166	0.233
Witnessed shooting	0.04	0.14	0.048	0.078
Robbed	0.07	0.15	0.09	0.161
Mother often knows whereabouts	0.698	0.609		
Father often knows whereabouts	0.43	0.299		

gun assault, respectively. When we correct for the greater reliance on hospitals for care among some groups, we find that blacks still have the highest rate of assault (42 percent of all injuries are assaults as opposed to 8 percent for whites) but the gap is somewhat smaller. Interestingly, racial differences in assault rates are greater for youths than adults.

We follow the analysis based on aggregate data with an analysis of personal exposure to violence as reported in the LA FANS survey. In table 9.3 we present the probabilities of exposure to different types of violence by neighborhood type (columns [1] to [2]). Personal exposure to violence consists of exposure to violent peers and exposure to street violence. The former is defined as whether the child knows any gang members and the latter is defined in one of two ways—whether the person witnessed a shooting or was robbed in the past year.

A violent neighborhood is defined as one in the top one-third of the distribution of violence as measured by the hospitalization rate for assault and a nonviolent neighborhood is in the bottom third of the distribution of violence. Living in a violent neighborhood increases one's exposure to violence: those in violent neighborhoods are more likely to know a gang member, witness a shooting, or be robbed. However, certain parental characteristics are just as important in determining exposure to violence. For example, whether a child's mother often knows his or her whereabouts is just as predictive of exposure to violence as a violent neighborhood (columns [3] and [4]). In other words, watchful parents appear to be just as protective as safe neighborhoods. A more formal decomposition of the effects of family versus neighborhood on exposure to violence suggests that family characteristics explain more of the variation in exposure to violence than do neighborhood characteristics, and the degree of difference depends on the measure of violence. For example, neighborhood characteristics explain less than 13 percent of the variation in violence as measured by whether the child knows a gang member and family characteristics explain slightly more than 15

Table 9.4 The overlap in violence

	Know gang	Shooting	Robbed
Robbed	16.36	33.85	
Witnessed shooting	20.12		25
Family often hits	28.48	39.39	36.36
Know gang		50	31.03

Note: As an example of how to read this table, 16.36 percent of those who know a gang member were robbed.

percent. For witnessing a shooting, the difference is much greater: neighborhood characteristics explain 12 percent while family characteristics explain 36 percent. For being robbed, family (5 percent) and neighborhood (1.8 percent) characteristics appear to explain much less of the variation.

There is also considerable overlap in the types of violence to which children in this sample are exposed. Of the children who report knowing someone in a gang, 16.36 percent of them were also robbed, 20.12 percent witnessed a shooting, and 28.48 percent reported that family members "often hit." Likewise for those who witness a shooting, 33.85 report being robbed and 50 percent know someone in a gang, and for those who have been robbed, 25 percent witnessed a shooting and 31 percent knew someone in a gang (table 9.4).

In table 9.5 we present evidence that the family characteristics of those exposed to violence are significantly different from those not exposed. The table includes three panels. The first is based on the full sample, the second and third are based on nonviolent and violent neighborhoods, respectively. We find important differences in the family background characteristics of those who are exposed to violence in this sample, even when we control for the underlying level of neighborhood violence as we implicitly do in panels 2 and 3. Those personally exposed to violence are more disadvantaged than those who are not, even conditional on the level of neighborhood violence. The largest differences are observed for those who witnessed a shooting (versus those who did not) and those who know gang members. We find considerably smaller differences for those who were robbed versus those who were not, which may suggest that of the measures of violence considered here, being robbed may be the least reflective of family disadvantage and may include a greater random or exogenous component than the other measures.

These descriptive analyses yield a number of interesting findings with respect to the role of violence in the lives of urban youth. First, violent neighborhoods are correlated with higher exposure to violence, but families living in violent neighborhoods are poorer, less educated, and more likely to be black or Hispanic than those living in nonviolent neighborhoods. Second, violence does not appear to be random. Children exposed to street violence

Table 9.5 **Personal exposure to violence and underlying family characteristics**

	Witness shooting			Robbed			Peers (know gang)		
	Nonviolent	Violent	Difference	Nonviolent	Violent	Difference	Nonviolent	Violent	Difference
				All neighborhoods					
Maternal education	12.32	10.05	2.27	12.26	11.76	0.51	12.31	11.22	1.09
Mother < High school	0.34	0.54	–0.21	0.34	0.39	–0.05	0.35	0.43	–0.09
Black	0.13	0.18	–0.05	0.13	0.16	–0.03	0.12	0.18	–0.05
White	0.29	0.13	0.16	0.28	0.29	–0.01	0.30	0.20	0.10
Hispanic	0.53	0.72	–0.19	0.54	0.54	0.00	0.52	0.66	–0.14
Asian	0.12	0.02	0.10	0.12	0.03	0.09	0.12	0.05	0.08
Male	0.51	0.59	–0.09	0.48	0.77	–0.29	0.54	0.52	0.02
Child age	15.05	15.24	–0.19	15.07	14.95	0.12	13.17	14.46	–1.28
Family earnings (in 1,000s)	46.92	15.59	31.33	46.20	36.35	9.85	45.88	32.87	13.01
Married	0.67	0.56	0.11	0.67	0.67	–0.01	0.69	0.55	0.14
Welfare receipt	0.10	0.33	–0.23	0.10	0.21	–0.11	0.10	0.24	–0.14
SSI receipt	0.04	0.06	–0.02	0.04	0.05	0.00	0.04	0.09	–0.05
				Nonviolent neighborhoods					
Maternal education	13.80	10.79	3.01	13.86	12.28	1.58	13.69	12.55	1.13
Mother < High school	0.20	0.47	–0.27	0.19	0.37	–0.18	0.21	0.27	–0.06
Black	0.09	0.07	0.03	0.09	0.10	–0.01	0.08	0.13	–0.04
White	0.45	0.14	0.31	0.43	0.51	–0.09	0.47	0.34	0.13
Hispanic	0.43	0.79	–0.36	0.46	0.36	0.10	0.40	0.62	–0.23

Asian	0.15	0.00	0.15	0.16	0.00	0.16	0.13	0.10	0.03
Male	0.52	0.50	0.03	0.49	0.80	–0.31	0.56	0.53	0.03
Child age	15.03	15.06	–0.03	15.07	14.72	0.35	13.29	13.98	–0.70
Family earnings (in 1,000s)	61.73	16.50	45.23	61.03	50.35	10.68	61.90	41.70	20.20
Married	0.71	0.78	–0.07	0.71	0.78	–.0.07	0.77	0.54	0.23
Welfare receipt	0.03	0.41	–0.38	0.04	0.13	–0.09	0.04	0.19	–0.15
SSI receipt	0.03	0.03	0.00	0.03	0.04	–0.01	0.03	0.07	–0.05
				Violent neighborhoods					
Maternal education	9.29	9.30	–0.01	9.06	10.47	–1.42	9.52	9.87	–0.35
Mother < High school	0.61	0.60	0.01	0.64	0.43	0.21	0.60	0.59	0.01
Black	0.20	0.31	–0.10	0.20	0.29	–0.09	0.19	0.27	–0.08
White	0.04	0.02	0.01	0.04	0.01	0.03	0.05	0.02	0.03
Hispanic	0.76	0.69	0.07	0.75	0.75	0.00	0.77	0.71	0.07
Asian	0.01	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.02
Male	0.48	0.67	–0.19	0.43	0.80	–0.36	0.53	0.53	0.00
Child age	14.92	15.47	–0.55	15.04	14.71	0.33	12.77	14.72	–1.95
Family earnings (in 1,000s)	25.53	12.21	13.32	24.43	21.56	2.87	23.41	19.04	4.37
Married	0.61	0.40	0.22	0.58	0.63	–0.05	0.62	0.47	0.15
Welfare receipt	0.17	0.36	–0.19	0.18	0.24	–0.06	0.17	0.38	–0.21
SSI receipt	0.04	0.06	–0.02	0.04	0.04	0.00	0.02	0.07	–0.05

(shootings and robbery) often associate with violent peers. In addition, even within violent neighborhoods, only some children report personal exposure to violence and those who do are more disadvantaged than those who do not. Together this preliminary evidence suggests that other forms of disadvantage, not simply neighborhood violence, may be responsible for the negative child outcomes associated with exposure to violence.

In order to determine whether it is exposure to violence itself or other characteristics that are correlated with violence and child outcomes, we must control for the underlying level of disadvantage as well as possible. For this we turn to regression analysis in the next section.

9.6 Does Exposure to Neighborhood Violence Affect Child Outcomes?

We pursue two empirical estimation strategies in order to determine whether it is exposure to violence that negatively affects child well-being or whether other types of disadvantage (income, educational, racial) may be correlated with violence that affect child outcomes. In the first, we conduct ordinary least squares (OLS) regression analysis of the impact of violence on child outcomes with and without controlling for other types of disadvantage. The first equation estimated is:

$$Y = \beta_0 + \beta_1 \text{Violence} + \varepsilon, \tag{1}$$

where Y is cognitive test scores for reading comprehension and math. The cognitive test scores are a percentile (0 to 100), normed against other children of the same age and sex. We focus on cognitive test scores because they are objective measures of child cognitive achievement that have been shown to significantly affect a child's future economic success (Currie and Thomas 2001; Zax and Rees 2001; Murname, Levy, and Willett 2005). Previous studies of the impact of violence on child outcomes have examined cognitive scores, GPAs, psychological evaluations, and the Behavior Problems Index (BPI). We also look at the impact of violence on the BPI. However, both GPA and BPI have strong subjective components that can bias these measures, whereas cognitive test scores suffer no such bias.

Violence in equation (1) is one of five measures of violence. The first and second are measures of neighborhood violence—the rate of assaults among those aged fifteen to nineteen (or the ratio, as defined previously) in the neighborhood (zip code) in which the child lives and the level of violent crime in the census tract.[10] The third is peer violence, which is defined as whether the child knows any gang members. The fourth and fifth measures

10. The census tract of children in the LA FANS is known and matched to the corresponding zip code. Of the eighty-nine census tracts in the LA FANS, fifty-eight matched to only one zip code and thirty-one matched to two or three zip codes. For children in census tracts with more than one zip code, the average assault rate across all zip codes that comprise the census tract was used.

of violence in equation (1) are defined in one of two ways—whether the person witnessed a shooting or was robbed in the past year. The error term ε includes all child, family, and neighborhood characteristics not included in the regression that influence child outcomes. Finally, we redefine neighborhood violence as the natural log of the violent crime rate in the census tract.

In the top panel of table 9.6 are regression estimates of the impact of violence (neighborhood, peer violence, and street violence) on child outcomes without any additional controls (equation [1]). It appears that neighborhood violence, as measured by the rate of hospitalizations for assaults, has a large negative and significant impact on both reading and math test scores (columns [1] and [2]). If the level of violence in one's neighborhood were to increase by one standard deviation (13 assaults per 10,000), then reading and math scores would decline by 7 and 6 points, respectively (or 23 and 22 percent of a standard deviation). Violent neighborhoods are also associated with both internalizing and externalizing behavioral problems (columns [3] and [4]). Internalizing behavioral problems refer to all problems that are directed inwardly. They include low or restricted activity levels, being shy, timid and unassertive, withdrawing from social situations, and acting in a fearful manner. The BPI (internalizing index) ranges from zero to 20, with a mean and standard deviation of 3. Externalizing behavioral problems include such behaviors as aggression, delinquency, and hyperactivity. The BPI externalizing index ranges from zero to 31, with a mean and standard deviation of 6. A standard deviation increase in neighborhood violence is associated with a half-point increase in both the internalizing and externalizing BPI, or 17 and 8 percent of a standard deviation increase, respectively.

Personal exposure to violence is also associated with worse test scores and greater behavioral problems. Association with violent peers (columns [5] and [6]) results in an 11 and 16 point drop in reading and math scores, respectively (37 and 54 percent of a standard deviation), and a 1 point and 3 point increase in internalizing and externalizing behavioral problems, respectively (30 percent and 50 percent of a standard deviation). Witnessing a shooting is associated with 16 and 18 point drops in test scores (49 and 61 percent of a standard deviation), and with a 45 and 55 percent standard deviation increase in internalizing and externalizing behavioral problems. Finally, being robbed in the past year is associated with 10 and 6 point drops (35 and 23 percent of a standard deviation, respectively) in reading and math, and a small insignificant increase in internalizing behaviors and a small (15 percent of a standard deviation), but significant increase in externalizing behaviors.

However, these estimates may be biased. Recall that in equation (1) the error term ε includes all child, family, and neighborhood characteristics not included in the regression that influence child outcomes. These include all

Table 9.6 **Impact of violence on child outcomes—Zip code level**

	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)
							No controls									
Assault rate in zip code	–4,903.18	–4,676.34	367.812	376.07												
	[732.222]	[704.495]	[76.838]	[159.347]												
Know someone in a gang					–10.636	–15.706	0.992	2.94								
					[2.541]	[2.411]	[0.271]	[0.552]								
Witnessed shooting last year									–15.65	–18.144	1.359	3.365				
									[4.302]	[4.122]	[0.451]	[0.926]				
Robbed last year													–10.556	–7.33	0.495	1.413
													[3.181]	[3.068]	[0.330]	[0.676]
Observations	827	827	811	794	819	819	803	786	827	827	811	794	826	826	810	793
R^2	0.05	0.05	0.03	0.01	0.02	0.05	0.02	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0	0.01
							Neighborhood (zip code) controls									
Assault rate in zip code	–332.286	732.312	191.221	61.696												
	[1,105.978]	[1,057.376]	[120.283]	[250.346]												
Know someone in a gang					–7.168	–12.124	0.772	2.727								
					[2.430]	[2.300]	[0.269]	[0.556]								
Witnessed shooting last year									–10.361	–12.867	0.932	2.907				
									[4.094]	[3.905]	[0.448]	[0.933]				
Robbed last year													–9.478	–6.075	0.45	1.366
													[3.000]	[2.877]	[0.325]	[0.677]
Observations	827	827	811	794	819	819	803	786	827	827	811	794	826	826	810	793
R^2	0.13	0.14	0.05	0.02	0.14	0.17	0.06	0.05	0.14	0.15	0.06	0.03	0.14	0.14	0.05	0.03

Neighborhood (zip code) and family controls																
Assault rate in zip code	131.784	1,023.61	266.94	171.19												
	[1,139.301]	[1,054.268]	[124.276]	[266.645]												
Know someone in a gang					–3.406	–7.705	0.446	2.232								
					[2.474]	[2.280]	[0.274]	[0.584]								
Witnessed shooting last year									–3.029	–6.247	0.757	2.066				
									[4.136]	[3.824]	[0.454]	[0.978]				
Robbed last year													–10.715	–6.074	0.412	0.665
													[3.121]	[2.905]	[0.340]	[0.732]
Observations	740	740	725	708	732	732	717	700	740	740	725	708	739	739	724	707
R^2	0.27	0.32	0.15	0.12	0.27	0.33	0.14	0.14	0.27	0.32	0.14	0.12	0.28	0.32	0.14	0.12
Neighborhood (zip code) fixed effects and family controls																
Know someone in a gang					–2.473	–5.802	0.508	2.274								
					[2.633]	[2.365]	[0.274]	[0.581]								
Witnessed shooting last year									–3.743	–5.938	0.862	2.22				
									[4.354]	[3.912]	[0.455]	[0.975]				
Robbed last year													–10.233	–5.412	0.341	0.595
													[3.184]	[2.879]	[0.340]	[0.727]
Observations					732	732	717	700	740	740	725	708	739	739	724	707
R^2					0.35	0.44	0.13	0.13	0.35	0.43	0.13	0.12	0.36	0.43	0.12	0.11

other types of disadvantage (racial, income, etc.). If these omitted variables are correlated with violence (i.e., if otherwise disadvantaged children are also exposed to more violence), then our estimate of β_1 will suffer from omitted variable bias—capturing not only the impact of violence on child outcomes, but also other types of disadvantage that can negatively affect child outcomes independent of violence. The bias in most cases will likely be upward if violence and disadvantage are positively correlated and child outcomes are negatively correlated with disadvantage. An upward bias means that our estimate of β_1 will be an overestimate of the true impact of violence on child well-being. It is possible, however, for our estimate of β_1 to be an underestimate of the impact of violence on child outcomes if either disadvantage is positively correlated with child outcomes and exposure to violence or disadvantage is negatively correlated with both child outcomes and exposure to violence. There is evidence, for example, that poor and minority families underreport their children's behavioral problems so that disadvantage and child outcomes are positively correlated for behavioral problems (Lambert et al. 1992; McMiller and Weisz 1996). It might also be the case that children in the most disadvantaged families are less likely to report exposure to violence if it might implicate them in criminal activity (such as knowing a gang member).

To correct for this bias, we include many detailed controls for locational, racial, income, and parental education disadvantage. As we control for these variables, the estimate of β_1 should decrease in magnitude. The second regression is:

$$(2) \quad Y = \beta_0 + \beta_1 \text{Violence} + \beta_2 \mathbf{Child} + \beta_3 \mathbf{Family} + \beta_4 \mathbf{Neighborhood} + \varepsilon,$$

where **Child** refers to a vector of child characteristics (sex, age, race, and number of siblings) and **Family** refers to a vector of family characteristics that include income and parental education disadvantage (maternal education, maternal age, marital status, family earnings, and welfare receipt). **Neighborhood** refers to a vector of neighborhood characteristics (share receiving welfare, share below poverty, share with less than a high school degree, the unemployment rate, and the share black) defined at the neighborhood level (either the zip code or the census tract, depending on the analysis) and based on data from the 2000 Census.

Estimates of equation (2) are presented in panel 2 of table 9.6. The following neighborhood (zip code level) controls are included: share on welfare, share below poverty, share with less than a high school degree, the unemployment rate, and the share black. When we include these controls for other neighborhood characteristics, many of the previous estimates of the impact of violence on child outcomes fall considerably. The impact of neighborhood violence falls by more than 80 percent for math and reading scores and is no longer significant. The impact of neighborhood violence on behavioral problems also falls and is no longer statistically significantly different from

zero. The impact of peer violence and witnessing a shooting on cognitive test scores and behavioral problems both fall by approximately 30 percent. The impact of being robbed, however, falls the least once we control for neighborhood characteristics, falling only between 10 and 15 percent.

In the third panel, we include controls for neighborhood and family characteristics. When we do, the impact of peer violence on cognitive performance and behavioral problems falls further still and remains significant for externalizing behavioral problems and math scores only. The impact of witnessing a shooting on all but externalizing behavioral problems falls and is no longer statistically significantly different from zero. Interestingly, the impact of being robbed in the past year on child scores changes very little when we control for family characteristics and is still significantly negatively associated with child test scores in reading and math.

In table 9.7 we present estimated regression coefficients for the full set of family and neighborhood controls from the previous regression. Of the neighborhood characteristics included, only the share of adults with less than a high school degree appears to largely, significantly, and negatively affect child outcomes. However, it could be that we are simply not including the most important neighborhood characteristics because they are intangible or unobservable to the researcher, a point to which we return. As for personal or family characteristics, race (being black or Hispanic), maternal education, family earnings, and welfare receipt have the largest effects on child outcomes.

But these estimates are still subject to the criticism that many important forms of neighborhood disadvantage are not captured in the data. If true, then our estimates of β_1 may still be biased. To address this, we include neighborhood fixed effects. The inclusion of fixed effects defined at the neighborhood level essentially limits our analysis to a comparison of children who have been exposed to violence with children who have not been exposed and reside in the same neighborhood. In so doing, we implicitly control for all sources of neighborhood disadvantage, observed or unobserved, that might be correlated with exposure to violence and could bias our results.

Panel 4 includes family controls and neighborhood (zip code) fixed effects. By including zip code fixed effects we are able to isolate the impact of exposure to violence separate from other forms of neighborhood disadvantage. When we do, the impact of violent peers on reading scores falls further still, while the impact on math score also falls but is still significant (5.8 points), as does the impact on externalizing behavioral problems. Again, the inclusion of these controls does not affect the impact of being robbed on child test scores, which is still negative and significant (10.2 and 5.4 points on reading and math, respectively) and the null effect on behavioral problems remains.

We reestimate the regressions presented in table 9.6, redefining the neighborhood at the census tract and the measure of neighborhood violence as

Table 9.7 **Impact of violence on child outcomes—Full set of neighborhood, family, and individual controls**

	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)
Assault rate in neighborhood	131.784	1,023.61	266.94	171.19												
	[1,139.301]	[1,054.268]	[124.276]	[266.645]												
Know someone in a gang					–3.406	–7.705	0.446	2.232								
					[2.474]	[2.280]	[0.274]	[0.584]								
Witnessed shooting last year									–3.029	–6.247	0.757	2.066				
									[4.136]	[3.824]	[0.454]	[0.978]				
Robbed last year													–10.715	–6.074	0.412	0.665
													[3.121]	[2.905]	[0.340]	[0.732]
Community characteristics																
Share on welfare	29.569	–7.224	–2.393	–1.057	29.371	–4.783	–2.381	–1.496	29.706	–6.737	–2.353	–1.015	30.458	–6.589	–2.347	–1.031
	[16.179]	[14.972]	[1.760]	[3.786]	[16.334]	[15.050]	[1.781]	[3.789]	[16.171]	[14.952]	[1.762]	[3.774]	[16.059]	[14.946]	[1.766]	[3.787]
Share below poverty	14.865	–9.062	3.965	9.208	16.792	4.549	5.866	9.446	17.397	2.408	5.792	9.692	11.222	–3.539	6.32	10.917
	[24.787]	[22.937]	[2.691]	[5.801]	[23.037]	[21.225]	[2.513]	[5.377]	[22.984]	[21.251]	[2.507]	[5.401]	[22.791]	[21.211]	[2.509]	[5.417]
Share < high school	–36.401	–61.485	1.079	4.361	–33.688	–56.727	2.252	5.506	–36.183	–57.676	2.337	5.266	–34.957	–56.443	2.242	5.071
	[26.303]	[24.340]	[2.884]	[6.206]	[25.940]	[23.899]	[2.853]	[6.068]	[25.802]	[23.856]	[2.834]	[6.069]	[25.614]	[23.839]	[2.839]	[6.089]
Unemployment rate	–1.061	0.583	–0.069	–0.286	–1.092	0.455	–0.079	–0.291	–1.093	0.481	–0.074	–0.279	–0.97	0.6	–0.084	–0.301
	[0.676]	[0.626]	[0.072]	[0.156]	[0.676]	[0.622]	[0.072]	[0.155]	[0.675]	[0.624]	[0.072]	[0.155]	[0.670]	[0.624]	[0.072]	[0.156]
Share black	–0.207	–5.403	–0.478	1.205	1.091	–2.358	0.129	1.536	0.176	–2.625	0.194	1.625	3.06	–1.096	0.097	1.473
	[9.829]	[9.096]	[1.050]	[2.252]	[9.385]	[8.647]	[1.009]	[2.139]	[9.353]	[8.648]	[1.004]	[2.143]	[9.325]	[8.679]	[1.009]	[2.159]
Family characteristics																
Maternal education	1.353	1.336	–0.028	–0.046	1.381	1.383	–0.032	–0.06	1.351	1.331	–0.027	–0.046	1.322	1.315	–0.026	–0.043
	[0.316]	[0.293]	[0.035]	[0.075]	[0.318]	[0.293]	[0.035]	[0.075]	[0.316]	[0.292]	[0.035]	[0.075]	[0.314]	[0.292]	[0.035]	[0.075]
Black	1.198	2.034	–0.198	–0.674	0.905	1.722	–0.1	–0.584	1.23	2.18	–0.162	–0.661	0.237	1.565	–0.117	–0.574
	[6.246]	[5.779]	[0.676]	[1.491]	[6.260]	[5.767]	[0.679]	[1.481]	[6.242]	[5.771]	[0.676]	[1.486]	[6.205]	[5.775]	[0.678]	[1.493]
Hispanic	–4.928	0.293	0.731	–0.191	–4.882	0.191	0.547	–0.522	–4.956	–0.22	0.556	–0.318	–6.401	–1.127	0.621	–0.197
	[5.793]	[5.361]	[0.626]	[1.382]	[5.762]	[5.309]	[0.624]	[1.365]	[5.750]	[5.317]	[0.622]	[1.369]	[5.723]	[5.327]	[0.625]	[1.377]

White	7.292	8.636	0.112	1.031	6.822	7.304	–0.032	1.001	7.21	7.947	–0.084	0.919	6.436	7.474	–0.054	0.967
	[6.025]	[5.575]	[0.652]	[1.441]	[5.983]	[5.513]	[0.649]	[1.419]	[5.971]	[5.520]	[0.646]	[1.425]	[5.933]	[5.521]	[0.648]	[1.431]
Asian	7.746	15.628	0.241	–1.248	7.645	14.532	0.103	–1.28	7.666	15.111	0.106	–1.31	5.82	14.083	0.172	–1.21
	[6.221]	[5.757]	[0.673]	[1.478]	[6.212]	[5.723]	[0.673]	[1.462]	[6.196]	[5.729]	[0.670]	[1.468]	[6.176]	[5.748]	[0.674]	[1.479]
Married	–1.976	1.084	–0.263	–0.747	–2.142	0.577	–0.253	–0.625	–1.92	1.177	–0.275	–0.792	–1.587	1.298	–0.279	–0.774
	[2.317]	[2.144]	[0.252]	[0.548]	[2.326]	[2.143]	[0.254]	[0.546]	[2.317]	[2.143]	[0.253]	[0.547]	[2.303]	[2.143]	[0.254]	[0.549]
Family earnings in 1,000s	0.061	0.098	–0.005	–0.009	0.061	0.099	–0.005	–0.009	0.059	0.094	–0.005	–0.008	0.056	0.094	–0.005	–0.009
	[0.027]	[0.025]	[0.003]	[0.006]	[0.027]	[0.025]	[0.003]	[0.006]	[0.027]	[0.025]	[0.003]	[0.006]	[0.027]	[0.025]	[0.003]	[0.006]
Welfare participation	–5.973	–5.92	0.929	3.753	–5.528	–5.222	0.827	3.421	–5.661	–5.441	0.799	3.472	–5.186	–5.724	0.861	3.684
	[3.333]	[3.084]	[0.370]	[0.796]	[3.343]	[3.080]	[0.373]	[0.794]	[3.354]	[3.102]	[0.374]	[0.803]	[3.308]	[3.079]	[0.372]	[0.798]
SSI receipt	–15.245	–15.36	–1.329	–4.084	–14.898	–14.693	–1.396	–4.323	–15.395	–15.772	–1.295	–4.011	–15.678	–15.473	–1.328	–4.099
	[4.781]	[4.424]	[0.544]	[1.243]	[4.793]	[4.416]	[0.548]	[1.236]	[4.780]	[4.420]	[0.544]	[1.240]	[4.775]	[4.444]	[0.549]	[1.255]
Maternal age	0.257	0.181	–0.006	–0.004	0.245	0.167	–0.003	–0.003	0.257	0.184	–0.004	–0.003	0.218	0.161	–0.003	0
	[0.140]	[0.130]	[0.016]	[0.035]	[0.141]	[0.130]	[0.016]	[0.035]	[0.140]	[0.129]	[0.016]	[0.035]	[0.139]	[0.130]	[0.016]	[0.035]
Child age 10–12	–10.356	24.198	–2.959	–3.509	–13.296	18.761	–2.858	–3.154	–10.064	25.621	–2.969	–3.549	–7.99	26.591	–3.049	–3.658
	[22.855]	[21.150]	[1.014]	[2.167]	[22.940]	[21.136]	[1.019]	[2.154]	[22.814]	[21.094]	[1.016]	[2.160]	[22.660]	[21.090]	[1.020]	[2.174]
Child age 13–15	–12.482	21.907	–2.852	–4.058	–14.797	17.417	–2.825	–3.961	–12.097	23.463	–2.905	–4.187	–10.88	23.814	–2.932	–4.177
	[22.768]	[21.069]	[0.985]	[2.104]	[22.835]	[21.039]	[0.989]	[2.090]	[22.733]	[21.019]	[0.987]	[2.099]	[22.573]	[21.009]	[0.990]	[2.109]
Child age 16–18	–13.022	19.273	–3.61	–5.212	–15.231	14.624	–3.623	–5.115	–12.694	20.691	–3.659	–5.3	–11.506	21.079	–3.698	–5.331
	[22.770]	[21.071]	[0.990]	[2.117]	[22.841]	[21.044]	[0.994]	[2.102]	[22.736]	[21.021]	[0.991]	[2.111]	[22.576]	[21.011]	[0.994]	[2.121]
Male	–1.745	5.991	–0.343	0.261	–1.895	5.803	–0.314	0.343	–1.655	6.207	–0.363	0.21	–0.456	6.785	–0.395	0.179
	[1.893]	[1.752]	[0.208]	[0.451]	[1.904]	[1.755]	[0.210]	[0.450]	[1.895]	[1.753]	[0.209]	[0.450]	[1.917]	[1.784]	[0.213]	[0.460]
Number of siblings	0.286	1.723	–0.036	0.165	0.219	1.656	–0.022	0.178	0.299	1.767	–0.03	0.157	0.259	1.735	–0.025	0.173
	[0.832]	[0.770]	[0.093]	[0.203]	[0.834]	[0.768]	[0.094]	[0.201]	[0.831]	[0.768]	[0.093]	[0.202]	[0.825]	[0.768]	[0.094]	[0.202]
Observations	740	740	725	708	732	732	717	700	740	740	725	708	739	739	724	707
R^2	0.27	0.32	0.15	0.12	0.27	0.33	0.14	0.14	0.27	0.32	0.14	0.12	0.28	0.32	0.14	0.12

Note: Standard errors in brackets.

the nature log of the violent crime rate. We do this because, as noted previously, the crime rate is available at a considerably smaller area (census tract) than the zip code that may better approximate a neighborhood. Note that since the violent crime data at the level for the census tract is available only for Los Angeles City (and not all of Los Angeles County), the sample size available for these analyses is smaller (approximately 500 versus 800). When we exclude all controls (top panel of table 9.8) we see that the violent crime rate has a negative and significant impact on all child outcomes, though the effect is not very large. For example, a 100 percent drop in violent crime would raise reading scores by 16 points (slightly more than a standard deviation). As we include neighborhood and family controls (second and third panels), the point estimates decrease considerably and lose significance, just as we observed for the zip code-level regressions. The remaining columns (columns [4] through [15]) present estimates of the impact of personal exposure to violence on child outcomes with controls for neighborhood characteristics defined at the smaller geographic level (census tract). In the last panel, we include neighborhood (census tract) fixed effects. In general, the results are very similar to those in which neighborhood is defined at the larger level of the zip code.

The results from the previous regressions suggest that once we control for other forms of disadvantage, violent neighborhoods, violent peers, and witnessing a shooting do not significantly negatively affect child cognitive achievement or internalizing behavioral problems—suggesting that underlying sources of disadvantage associated with both exposure to violence and child outcomes are likely responsible for the poor outcomes observed. They do seem to be correlated with externalizing behavior problems. The fact that the estimated impact of these types of violence on child outcomes falls as more child, family, and neighborhood controls are included underscores the importance of controlling for underlying disadvantage that may be correlated with both exposure to violence and child outcomes to produce unbiased estimates.

In contrast, the negative impact of one measure of violence (being robbed in the past year) on child test scores remains once we control for neighborhood and family characteristics, though there do not appear to be any significant effects on behavioral problems. It could be that we are not adequately controlling for differences across families within neighborhoods that are correlated with both exposure to violence and poor child outcomes. Recall from table 9.5 that the observed family characteristics of those who were robbed were very different from those who were not, even when limiting the comparison to families in violent neighborhoods. If families differ in observed ways, they may also differ in unobserved ways for which we cannot control and that may continue to bias our estimates. An important example may be domestic violence—as noted previously, children in disadvantaged families are more likely to witness domestic violence, which may also be correlated with exposure to street violence. Because the LA FANS does not

Table 9.8 **Impact of violence on child outcomes—census tract level**

	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)
							No controls									
ln (violent crime in census tract)	–16.333	–14.961	1.244	1.661												
	[1.486]	[1.543]	[0.196]	[0.345]												
Know someone in a gang																
Witnessed shooting last year																
Robbed last year																
Observations	528	528	509	503												
R^2	0.19	0.2	0.08	0.05												
							Neighborhood (census tract) controls									
ln (violent crime in census tract)	–11.132	–11.924	0.478	0.745												
	[2.501]	[2.617]	[0.333]	[0.600]												
Know someone in a gang					–6.125	–11.17	0.671	2.732								
					[2.417]	[2.265]	[0.263]	[0.562]								
Witnessed shooting last year									–7.88	–11.967	0.84	2.746				
									[4.102]	[3.868]	[0.439]	[0.946]				
Robbed last year													–8.908	–8.048	0.44	1.11
													[3.013]	[2.852]	[0.320]	[0.690]
Observations	528	528	509	503	819	819	788	771	827	827	796	779	826	826	795	778
R^2	0.22	0.21	0.11	0.06	0.16	0.2	0.1	0.07	0.16	0.19	0.1	0.05	0.16	0.19	0.09	0.04

(*continued*)

Table 9.8 (continued)

	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)	Reading	Math	BPI (int)	BPI (ext)
Neighborhood (census tract) and family controls																
ln (violent crime in census tract)	–3.525	–4.532	0.07	1.151												
	[2.871]	[2.947]	[0.387]	[0.720]												
Know someone in a gang					–3.603	–7.985	0.484	2.339								
					[2.445]	[2.248]	[0.273]	[0.586]								
Witnessed shooting last year									–3.058	–6.313	0.863	2.098				
									[4.123]	[3.806]	[0.452]	[0.981]				
Robbed last year													–10.197	–5.727	0.243	0.496
													[3.096]	[2.875]	[0.337]	[0.729]
Observations	472	472	457	450	732	732	705	688	740	740	713	696	739	739	712	695
R^2	0.31	0.31	0.19	0.13	0.26	0.32	0.12	0.13	0.26	0.32	0.12	0.11	0.27	0.32	0.12	0.11
Neighborhood (census tract) fixed effects and family controls																
Know someone in a gang					–2.964	–6.049	0.458	2.047								
					[2.657]	[2.379]	[0.292]	[0.636]								
Witnessed shooting last year									–4.294	–6.242	0.503	2.067				
									[4.423]	[3.961]	[0.480]	[1.041]				
Robbed last year													–10.285	–5.4	0.327	0.458
													[3.217]	[2.899]	[0.347]	[0.754]
Observations					732	732	705	688	740	740	713	696	739	739	712	695
R^2					0.33	0.42	0.23	0.23	0.33	0.42	0.22	0.22	0.34	0.42	0.22	0.22

Note: Standard errors in brackets.

contain credible measures of domestic violence, we are not able to control for this directly.

To address this concern, we present estimates of the impact of exposure to violence on child outcomes including family fixed effects in table 9.9. By including family fixed effects we limit our analysis to a comparison to children who have been exposed to violence with their siblings who have not been exposed, thereby implicitly controlling for all measures of family disadvantage, both observed and unobserved, that may be correlated with worse child outcomes and exposure to violence. This would include, for example, exposure to domestic violence. An analysis that includes family fixed effects must, by definition, include only those children in families with at least two children included in the LA FANS survey. This limits our sample to roughly 575 children in the case of violent peers, and 375 for the two other measures of exposure to violence (witness a shooting or being robbed last year). Because the sample has changed, for purposes of comparison in the top panel of table 9.9 we present OLS estimates of the impact of exposure to violence on child outcomes including family controls and neighborhood fixed effects (but not family fixed effects), and in the bottom panel we include family fixed effects. When we include family fixed effects in the last panel the large and significant effects of being robbed on reading and math scores are close to zero and no longer significant. However, those who know someone in a gang still have lower reading scores (8 points or 60 percent of a standard deviation). One concern over interpreting this latter estimate as causal, however, is that those of lower cognitive ability may choose to associate with violent appears. While the family fixed effect estimate does partially address this concern because cognitive ability within families is highly correlated (and much more so than across families), differences in cognitive ability across siblings still exist and may drive this relationship.

Interestingly, the impact of all three measures of violence on internalizing behavioral problems increases and becomes borderline significant when family fixed effects are included. The point estimates of 1.23, 1.99, and 1.50 suggest that exposure to violence increases the BPI by half a standard deviation. This is an interesting finding that may be explained by the fact that the BPI is based on parent reports and parents in disadvantaged families may be less likely to report behavior as problematic. For example, in the LA FANS, the average internalizing BPI of black children is 2.84 compared with 3.17 for nonblack children (the numbers are 6.1 and 7.7 for the externalizing BPI score). This is consistent with the findings of others (see Spencer et al. 2005; Ng 2006) based on other larger data sets. As such, when we limit our comparison to that between siblings within the same family, we eliminate the family-based reporting bias that can bias downwards our estimates of the impact of exposure to violence on children's internalizing behavioral problems.

Table 9.9 **Impact of violence on child outcomes, family fixed effects**

	Reading	Math	BPI (Int)	BPI (Ext)	Reading	Math	BPI (Int)	BPI (Ext)	Reading	Math	BPI (Int)	BPI (Ext)
					Family controls and neighborhood fixed effects							
Know someone in a gang	–2.397	–7.623	1.112	2.569								
	[2.954]	[2.996]	[0.382]	[0.712]								
Witnessed shooting last year					–6.681	–12.147	–0.679	1.741				
					[6.252]	[5.426]	[0.747]	[1.413]				
Robbed last year									–11.244	–6.157	0.226	–0.043
									[4.606]	[4.057]	[0.550]	[1.044]
Observations	577	576	570	561	384	384	381	371	384	384	380	370
R^2	0.47	0.51	0.31	0.43	0.51	0.62	0.33	0.49	0.52	0.62	0.33	0.49
					Family fixed effects							
Know someone in a gang	–4.601	–8.259	1.23	0.723								
	[3.666]	[3.913]	[0.452]	[1.153]								
Witnessed shooting last year					7.23	–3.892	1.991	4.735				
					[11.103]	[9.428]	[1.192]	[2.486]				
Robbed last year									–1.776	1.436	1.497	–1.165
									[7.048]	[5.965]	[0.770]	[1.556]
Observations	577	576	570	561	384	384	381	371	384	384	380	370
R^2	0.77	0.79	0.78	0.81	0.88	0.91	0.86	0.88	0.87	0.91	0.86	0.88

Note: Standard errors in brackets.

9.7 Conclusion

Together these results suggest that care should be taken in interpreting estimates of the impact of exposure to neighborhood violence on child outcomes. Previous work has found that exposure to violence is associated with many negative child outcomes (both cognitive and behavioral) but much of this work, while acknowledging that children exposed to violence are often more disadvantaged in other ways, rarely controls for such differences. Without controlling for such differences estimates of the impact of exposure to violence on child outcomes are likely biased—reflecting the impact of both exposure to violence and underlying neighborhood and family disadvantage on child outcomes. In the work presented here we employ econometric strategies to control for such differences by including multiple measures of neighborhood and family disadvantage as covariates. We also include neighborhood and family fixed effects, which control for both observed and unobserved characteristics of a child's neighborhood and family that might bias estimates of the impact of violence on child outcomes.

Once we control for underlying disadvantage, the impact of violence declines for some child outcomes, suggesting that underlying disadvantage does explain some of the negative outcomes observed, but not all. In fact, for internalizing behavior problems, controlling for underlying differences across families actually tends to increase the impact of all three measures violence. And it is still the case that even when we control for observed and unobserved underlying disadvantage, having violent peers (knowing a gang member) is negatively correlated with cognitive test scores.

These findings have implications for public policies regarding the reduction of violence as well as housing for the poor. In particular, the evidence presented here suggests that reducing neighborhood violence via enhanced law enforcement policies without reducing other sources of neighborhood disadvantage may have a limited impact on the youth outcomes examined here. Housing policies, and in particular, housing subsidies that enable low-income families to move to less disadvantaged neighborhoods, may be more effective in this regard, especially if they improve the personal circumstances (i.e., employment and income) of the target families. In this respect, policies aimed directly at lessening the income and educational disadvantages of families may prove the most effective.

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