THE ACUTE EFFECT OF LOCAL HOMICIDES ON CHILDREN'S COGNITIVE PERFORMANCE

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ABSTRACT

This study estimates the acute effect of local homicides on the cognitive performance of children across a community. Data are from a sample of children age 6-17 in the Project on Human Development in Chicago Neighborhoods. The acute effect of local homicides on vocabulary and reading assessments is identified by exploiting exogenous variation in the relative timing of local homicides and interview assessments among children living within the same neighborhood but assessed at different times. Among African Americans, exposure to a homicide in the child's block group that occurs less than a week prior to the assessment reduces performance on vocabulary and reading assessments by roughly one half standard deviation. Results are replicated using a second independent dataset from Chicago. Findings suggest the need for a broader recognition of the impact that extreme acts of violence have on children across a neighborhood, regardless of whether the violence is witnessed directly.

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Despite the national decline in homicides that occurred from the mid 1990s to the mid 2000s, homicide remains among the leading causes of death among 15-24 year olds nationally and is the top cause of death among African Americans in this age range.(*1*) These figures reflect the toll that homicide takes in terms of lives lost, but they may understate the total impact of extreme violence among children living in violent areas. Research examining direct exposure to serious violence among youth suggests possible effects on a range of developmental outcomes, although the estimates are subject to problems of selection bias.(*2-5*) This study takes a broader view and examines the impact of extreme violence as felt across a community, regardless of whether the violence is witnessed directly. Specifically, the analysis estimates the acute effect of local homicides on children's cognitive performance, as measured with two assessments of vocabulary and reading skills.

Identifying the impact of local homicides on youth outcomes is difficult because the experience of living near a homicide cannot be reproduced in an experimental setting, and homicides are not distributed randomly across neighborhoods in a city. Estimates will be biased if unobserved factors jointly predict selection into a violent environment and the outcome of interest. To address the selection bias problem a method is developed that exploits exogenous variation in the relative timing of interview assessments and local homicides among children living within the same neighborhood.

Data on all reported homicides occurring in Chicago from 1994 through 2001 are merged with data from a survey of children and families in Chicago conducted over the

same timeframe—the Project on Human Development in Chicago Neighborhoods (PHDCN).(*6*) The analytic method takes advantage of the fact that interview assessments for the PHDCN were conducted, at each of three survey waves, over a period covering several months. The impact of a recent, local homicide is identified by comparing scores on cognitive assessments among children living within the same neighborhood who were assessed at different times—some were assessed in the days following a local homicide while others were assessed months later or earlier. The central assumption underlying the method is that, within a given neighborhood, the timing of homicides in relation to the timing of interview assessments produces exogenous variation in the recency of local homicides; this exogenous variation serves as the basis for causal inference.

Data, measures and methods

The PHDCN is a longitudinal study of families with children that has collected extensive information on child development in three interview waves, including assessments of vocabulary/reading skills among adolescents. The sample is representative of families with children living in Chicago in 1995. Families were followed wherever they moved over a period ranging from late 1994 through 2002, and residential addresses were geocoded at all three interview waves, allowing researchers to link families to their residential location through restricted-use files. The second source of data is a geocoded file identifying the location and date of every homicide reported by the Chicago Police Department from 1994 through 2002. Neighborhoods are operationalized using three successively larger nested boundaries: block groups, census tracts, and neighborhood clusters (see supplementary materials for definitions of each geographic boundary).(*7, 8*)

Two assessments are available in the PHDCN to measure vocabulary and reading skills, both of which have been validated and used extensively in previous research using the PHDCN to capture key verbal/language skills important for social interaction and academic achievement.(*9-11*) The first is a vocabulary subtest from the Wechsler Intelligence Scale for Children-Revised (WISC-R) (sample mean over all three PHDCN waves=7.87, SD=3.12).(*12*) The second is a letter and word reading subtest from the Wide Range Achievement Test (WRAT3) (sample mean at PHDCN wave 1=96.24, SD=19.42).(*13*) The assessments were given to children in age cohorts 6, 9, 12 and 15 at Waves 1 and 2 of the survey, and to children in age cohorts 3, 6, 9, and 12 at Wave 3 of the survey. Sample members from age cohort 18 of the PHDCN are excluded in all waves and sample members from age cohort 15 are excluded in Wave 3 because they received a different assessment designed for adults.

Using the merged data file children's vocabulary/reading scores are regressed on an indicator for a recent homicide in the census tract, with tract by survey wave fixed effects, as in Equation 1:

$$(1) \qquad Y_i = \alpha + \beta(\text{Homicide})_i + \boldsymbol{\delta}(\mathbf{Wave} \times \mathbf{Tract})_i + \boldsymbol{\gamma}(\mathbf{Year})_i + \boldsymbol{\tau}(\mathbf{Month})_i + \varepsilon_i \ ,$$

where Y_i is child *i*'s score on one of two assessments of cognitive skills, **Wave** and **Tract** represent census tract by survey wave indicators, **Year** and **Month** represent calendar year and month of year indicators, and "Homicide" is an indicator taking on a value of unity if the child's assessment was conducted within a given period following a homicide in the census tract; β is the coefficient representing the effect of a local and recent homicide on the child's cognitive assessment score.[2]

[2] Additional details are available in the supplement.

The inclusion of tract by survey wave fixed effects means that the estimator relies entirely on variation in the relative timing of individual assessments and local homicides *within a given census tract and within a particular survey wave*. Calendar year indicators are included to control for period effects. Month of year indicators are included to address the possibility that the time of year in which sample members are assessed could produce a spurious assocation between exposure to local homicides and cognitive performance. This is possible because homicides are more common in the summer months, and research shows that students score lower on standardized assessments when school is out of session.(*14*)

Results

From 1994 through 2002, there were 6,041 homicides in Chicago that were reported by the Chicago Police Department and successfully geocoded. The annual total was highest in 1994 (926 annual homicides), dropping in each year until 2001, when the number of homicides rose for a single year to 666 before dropping again in 2002. Exposure to local homicides varies substantially by race/ethnicity. Among African American sample members in the PHDCN, 54 assessments were conducted within four days of a homicide in the census tract (2.1%), 92 were within seven days (3.5%), 131 were within 10 days (5.0%), 170 were within 14 days (6.5%), and 325 were within 28 days (12.5%). Exposure to local homicides is much less common among Hispanics, and is extremely rare among whites. For example, among Hispanics only 57 assessments were conducted within a week of a homicide in the census tract (1.6%), and among whites only 6 assessments were conducted within a week of a homicide (0.6%).

The effect of a local homicide is estimated separately for African Americans and Hispanics so that all comparisons are made within race/ethnic groups; whites and members of other race and ethnic groups are excluded because results for these groups would be based on only a handful of individuals in the sample who contribute to the estimate. Estimates represent the effect of a local (within the block group, tract, or neighborhood cluster of residence) homicide occurring within different time intervals preceding the assessment, including tract by survey wave fixed effects, and controlling for calendar year and month of year.

Figures 1 and 2 show a series of point estimates representing the effect of exposure to a homicide within African American children's neighborhoods, using three successively larger geographic levels of analysis: block groups, census tracts, and neighborhood clusters—estimates for Hispanics are null in almost every specification and thus are not shown, but are available in the supplementary materials. From left to right, the figures show the effect of a homicide that occurs within 4 days, 7 days, 10 days, 14 days, and 28 days prior to the cognitive assessment.

Figure 1 displays results using the WISC-R vocabulary score as the dependent variable, and Figure 2 displays results using the WRAT3 reading score as the dependent variable. From Figure 1, exposure to a homicide in the block group that occurs within four days of the assessment reduces African Americans' WISC-R scores by 1.45 points ($p<.10$), an effect that is marginally significant at conventional levels. The estimated effect of exposure to a homicide within a week of the assessment is estimated more precisely ($b=-1.41$, $p<.01$); a homicide in the child's block group within a week of the WISC-R assessment reduces children's scores by .45 standard deviations. Estimated

effects of exposure to homicides in the block group occurring more than a week prior to the assessment are non-significant. The effects of exposure to a homicide in the child's census tract or neighborhood cluster that occurs within four days of the assessment are negative, but only the effect of a homicide in the tract is marginally significant (b=-.67, p<.10) and each of the estimates is substantially smaller in magnitude than the effect of a homicide occurring in the block group. As the duration of time between the homicide and the assessment widens the estimated effects of homicides in the census tract and the neighborhood cluster are weak and non-significant.

Results shown in Figure 2 indicate that living in a block group where a homicide occurs within four days of the assessment reduces African Americans' scores on the WRAT3 by 9.94 points (p<.05), an effect size equal to one half standard deviation. The estimated effect of exposure to a homicide in the block group within a week of the assessment is also substantively large, but is estimated imprecisely and is not significant. As the time window between the homicide and the assessment extends beyond a week the effect size again becomes smaller, a pattern that is present for both assessments and at all levels of analysis. Homicides occurring in the child's census tract or neighborhood cluster have non-significant effects on WRAT3 scores regardless of the duration of time between the homicide and the assessment.

Tests of robustness

While the analytic approach is designed to be robust to selection bias by making comparisons within neighborhoods, the assumption of exogenous variation in the recency of local homicides could be violated if there is systematic heterogeneity among African American children living within the same neighborhood who were assessed at different

times. It is possible, for instance, that violence in the neighborhood may have induced some caregivers to reschedule an interview out of concern for the child's safety or psychological state. This possibility is not testable directly, but it is possible to assess whether there are observable differences in caregiver or child characteristics among children living in the same neighborhood who were exposed and not exposed to local homicides in the period before the assessment. Focusing on African Americans, results shown in the supporting materials reveal no systematic heterogeneity in any key caregiver characteristics or in children's self-reported violent activity. Compared to other children in the neighborhood who were assessed at different times, African American children assessed within four days or a week of a local homicide are from families with no substantive difference in income levels, caregiver education, or caregiver marital status, and these children do not differ in their self-reported violent behavior over the year prior to the survey assessment. This evidence provides support for the assumption that within-neighborhood variation in the relative timing of homicides and survey assessments is exogenous.

As a second test of robustness, Figures 3 and 4 compare the effect of exposure to a local homicide in the days preceding the cognitive assessment with the effect of exposure to a local homicide in the days *following* the assessment. If the results described to this point represent true effects of exposure to local homicides, there should be no effect of exposure to a local homicide that occurs in the days after the assessment. Figures 3 (WISC-R scores) and 4 (WRAT3 scores) show point estimates from specifications estimating the effect of a homicide within four days and seven days prior to the assessment compared with point estimates from specifications estimating the effect of

exposure to a homicide within four and seven days following the assessment. Results from both figures show the same pattern—exposure to a homicide in the days following the assessment has no effect on vocabulary or reading scores.

Replication

Results presented to this point are based on a relatively small number of children who were assessed within a short period following a local homicide in their neighborhood; with this in mind, replications of the analysis are essential before drawing strong conclusions. This section describes results from a replication using data from the Chicago sample of the Three City Study of Welfare, Children & Families,(*15, 16*) a longitudinal study of low-income families living in three cities (Boston, Chicago and San Antonio) that began in 1997. The Three City Study includes an independent sample from the same city as the PHDCN sample—Chicago—and the timing of the survey overlaps with the timing of the PHDCN, reducing the possibility that period effects may obscure comparisons of results from the two surveys. The Three City Study collected information from a sample of low-income families, including assessments of cognitive skills based on a letter-word identification subtest and an applied problems subtest from the Woodcock-Johnson Psycho-Educational Battery-Revised.(*17*) The availability of both assessments allows for a test of whether the pattern of results is unique to verbal/reading skills or to specific features of the WISC-R or WRAT3 assessments used in the PHDCN.[3]

Figures 5 and 6 display results from specifications that replicate those presented in Figures 1 and 2, using the Woodcock-Johnson assessments as dependent variables and the Three City Study Chicago sample. The two measures of cognitive skills are regressed on an indicator for whether the child was assessed within a given time frame of a local

[3] Additional details of the analysis and the Three City Study dataset are available in the supplement.

homicide in the census tract of residence, including tract by survey wave fixed effects, and calendar year and month of year fixed effects. Only information on the census tract of residence is available in the Three City Study. Separate models are estimated for African Americans and Hispanics, and whites and members of other race/ethnic groups are excluded. Similar to the PHDCN, estimated effects are null for Hispanics and are not shown in the figures.

Results for African Americans displayed in Figures 5 and 6 replicate those found using the PHDCN, except that the impact of a homicide in the census tract is stronger in the Three City Study. Figure 5 indicates that exposure to a homicide in the child's census tract within four days of the assessment reduces scores on the letter-word subtest by .6 standard deviations ($b=-11.17$, $p=.05$), and a homicide within a week of the assessment reduces scores by .48 standard deviations ($b=-9.00$, $p<.05$). As the window of time between the homicide and the assessment expands to ten days, the effect on the letter-word assessment is smaller but remains marginally significant ($b=-7.20$, $p<.10$). Figure 6 indicates that exposure to a local homicide occurring within four days of the applied problems subtest reduces scores by .54 standard deviations ($b=-9.45$, $p<.10$), and exposure to a homicide within a week of the assessment reduces scores by .46 standard deviations ($b=-8.02$, $p<.10$).

Discussion

Evidence from two independent samples of children in Chicago show that exposure to a local homicide within a short period of time preceding a cognitive assessment reduces performance substantially, a finding that is present among African Americans but not Hispanics. The magnitude of the effect varies depending on the

sample, the assessment, the proximity of the homicide to the child's residence, and the length of time that passes between the homicide and the assessment. In the PHDCN, exposure to a homicide within the block group that occurs within a week of the WISC-R vocabulary assessment reduces scores by almost one half standard deviation, and exposure to a homicide within the block group that occurs within four days of the assessment reduces WRAT3 reading scores by one half standard deviation. In the Three City Study Chicago sample, exposure to a homicide within the census tract that occurs within a week of the assessment reduces Woodcock-Johnson letter-word scores and applied problems scores by roughly one half standard deviation as well, and the effect remains significant as the window of time extends to a week.

In each case, the estimated effects of recent local homicides are substantial, suggesting that local homicides have a non-trivial acute effect on African American children's performance on cognitive tests that fades away as the window of time between the homicide and the assessment widens. In the PHDCN sample, the effect of a homicide appears strongest when the homicide occurs close to the child's home, within the block group of residence. However, strong effects of homicides occurring in the census tract are found in the Three City Study sample.

While the results provide evidence that local violence weighs on the minds of children as they approach cognitive assessments, the mechanisms producing lower levels of cognitive performance are not testable with the available data. One plausible mechanism is acute stress experienced by children living in areas where a homicide occurs. While neither the PHDCN nor the Three City Study includes survey items designed to allow for diagnosis of acute stress disorder, the characteristics of the disorder,

symptoms, and duration of symptoms suggest a plausible link to the pattern of findings presented in this analysis. Acute stress disorder is defined as a response to a threatening event that induces fear, helplessness, or horror. Among other symptoms are reduced awareness and difficulties with concentration for a period lasting at least two days and up to one month following the stressor.(*18-22*)

It is not clear why local homicides would generate acute stress among African Americans and not Hispanics. One possible explanation is suggested by an analysis of victims' race/ethnic backgrounds, which indicates that homicide victims in Hispanics' neighborhoods are often African American, which could make the homicide less threatening or salient in a child's life.[4] By contrast, homicide victims in African Americans' neighborhoods are almost always of the same race. The racial/ethnic difference in the effect of local homicides is an unexpected finding, however, and warrants additional research.

With this caveat in mind, this study provides evidence for acute effects of community violence that is robust to the problem of selection bias, a problem that has plagued the observational literature on exposure to violence.(*23-26*) The identification strategy developed here addresses the selection bias problem by exploiting variation in the recency of local homicides arising from the relative timing of interview assessments and local homicides among children living within the same neighborhood.

While previous research has considered the impact of long-term exposure to community violence on children's cognitive and development trajectories, this analysis shifts focus toward the impact of acute events in children's environments that may be felt

[4] Among Hispanics exposed to local homicides within the week prior to the assessment, 54% of victims were Hispanic. Among African Americans exposed to local homicides within the week prior to the assessment, 87% of victims were African American.

over days or weeks of a child's life. The results indicate that the impact of violence is not limited to those victimized or those who directly witness an act of violence, but appears to be felt by children across a community who live in close proximity to extreme violent events. This finding has implications for efforts to mitigate the harmful consequences of exposure to violence. Whereas reviews of the literature have called for interventions designed to provide treatment or counseling for children directly exposed to violence within the home, school, or neighborhood environment,(*4*) the current findings suggest the need for a broader recognition of the impact that violence can have on children living in the area, regardless of whether they witness violence directly or are personally victimized.

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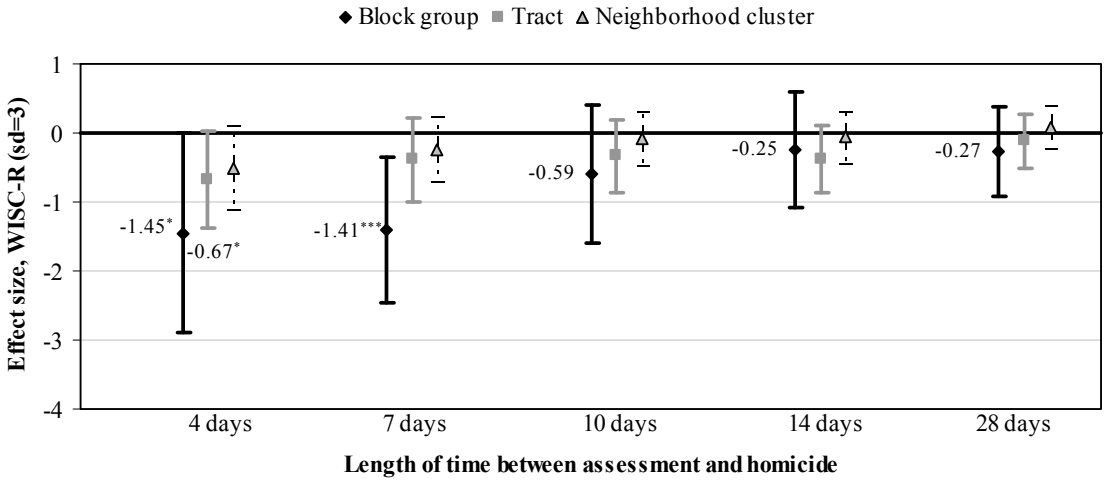

Figure 1. Effect on WISC-R scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African Americans only. PHDCN, n=1,139. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

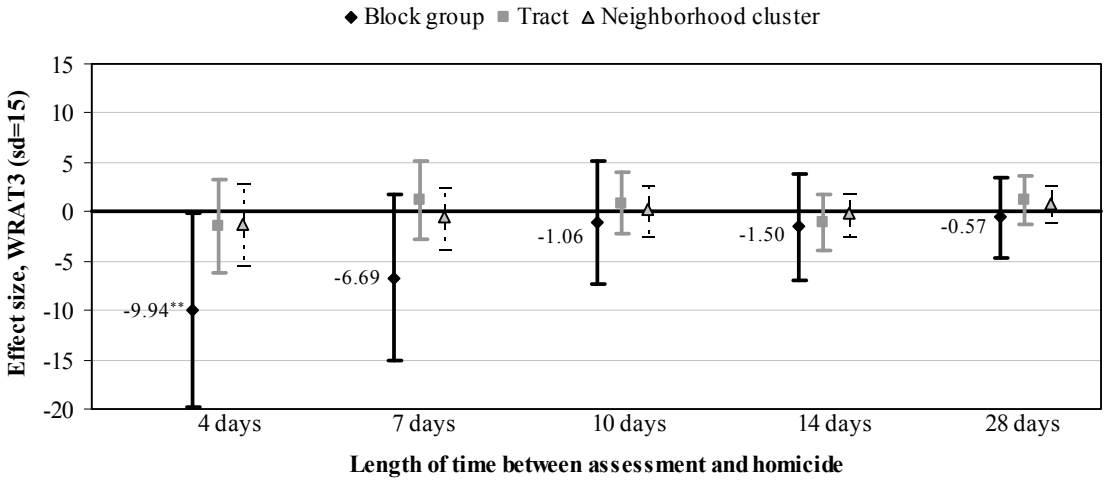

Figure 2. Effect on WRAT3 scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African Americans only. PHDCN, n=1,132. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

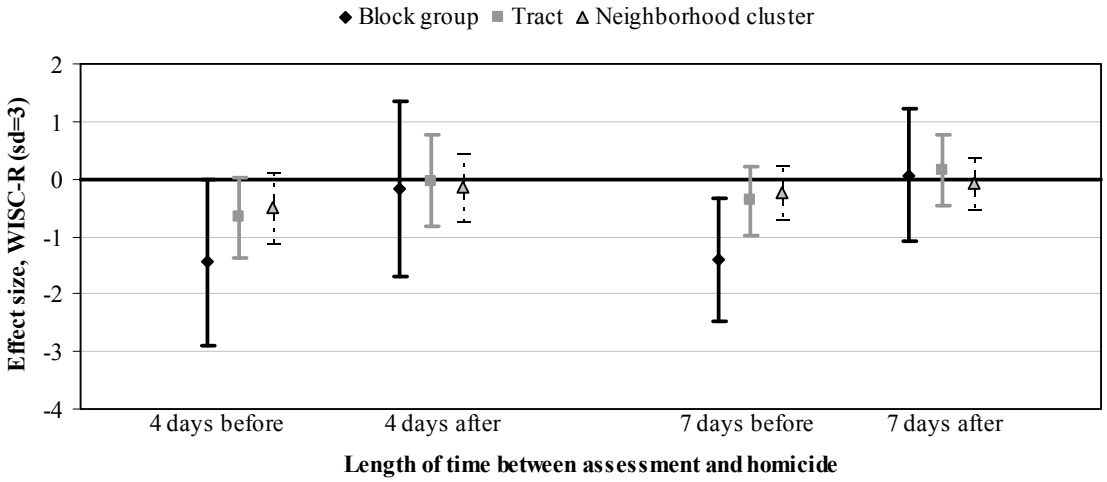

Figure 3. Effect on WISC-R scores of a recent homicide occurring during the specified period *before* or *after* the cognitive assessment, shown for homicides occurring within the block group, census tract, or neighborhood cluster, African Americans only. PHDCN, n=1,139.

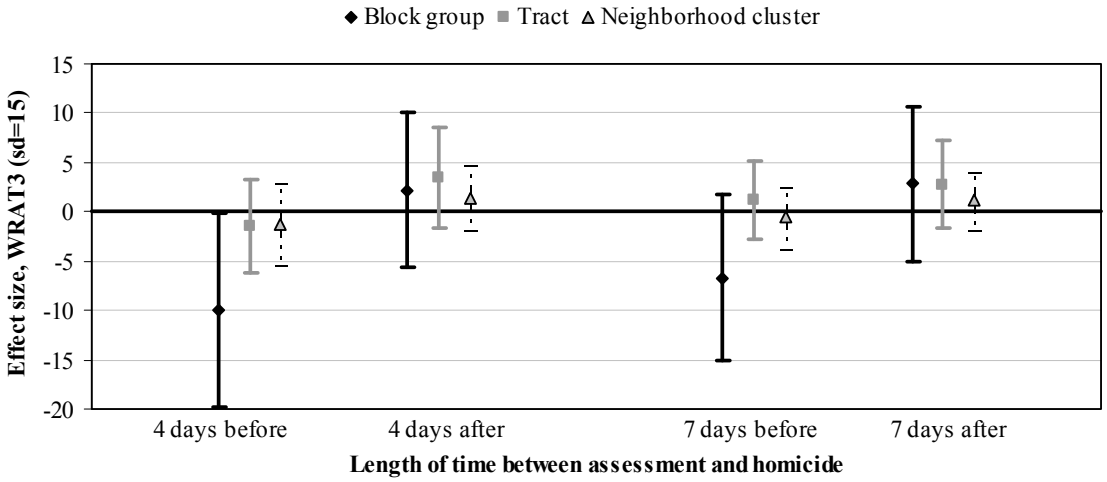

Figure 4. Effect on WRAT3 scores of a recent homicide occurring during the specified period *before* or *after* the cognitive assessment, shown for homicides occurring within the block group, census tract, or neighborhood cluster, African Americans only. PHDCN, n=1,132.

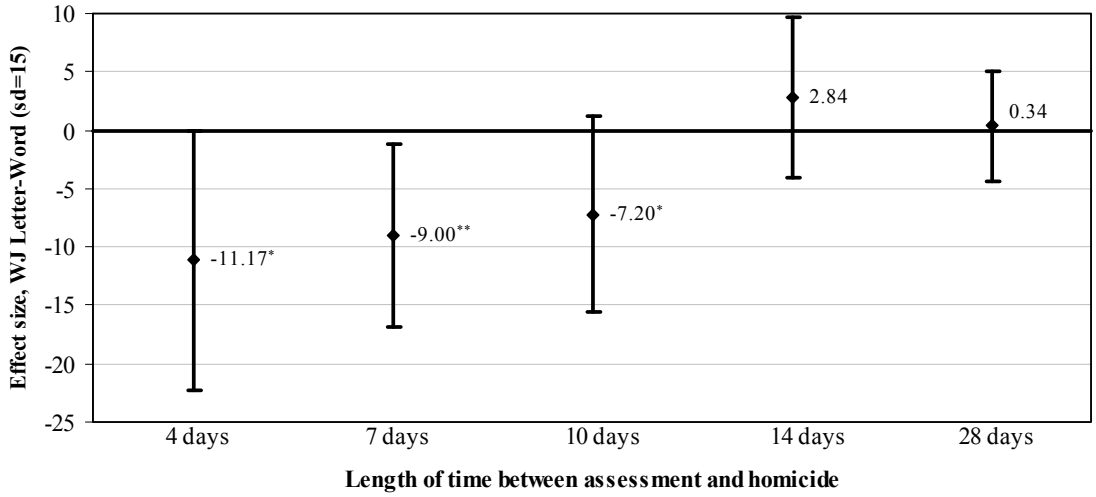

Figure 5. Effect on WJ Letter-Word scores of a recent homicide occurring within the census tract, African Americans only. Three City Study of Welfare, Children and Families, n=304. *** = p<.01; ** = p<.05; * = p<.10.

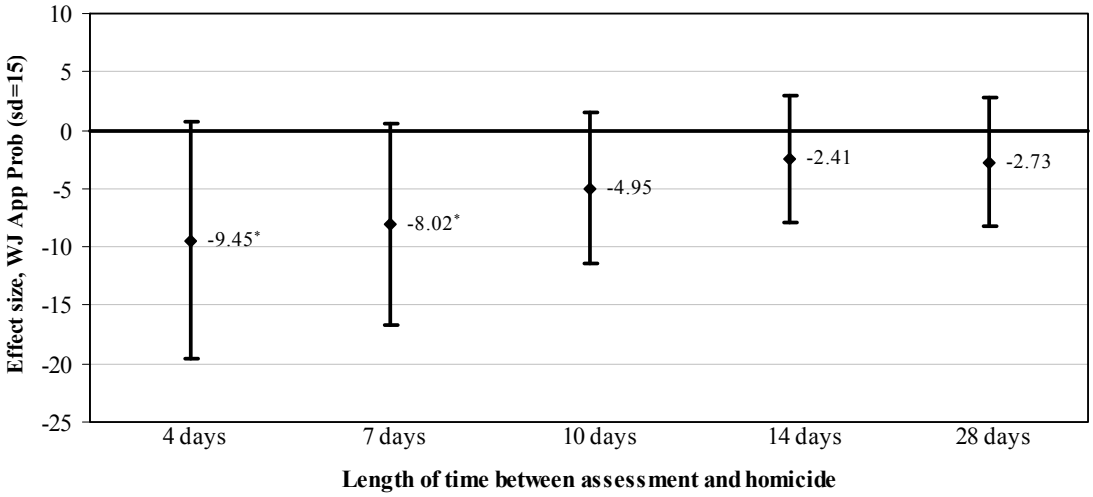

Figure 6. Effect on WJ Applied Problems scores of a recent homicide occurring within the census tract, African Americans only. Three City Study of Welfare, Children and Families, n=304. *** = p<.01; ** = p<.05; * = p<.10.

THE ACUTE EFFECT OF LOCAL HOMICIDES ON CHILDREN'S COGNITIVE PERFORMANCE

SUPPLEMENTARY MATERIALS

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Descriptions of the data

Two datasets were used in the analysis. The first is the Longitudinal Cohort Study from the Project on Human Development in Chicago Neighborhoods (PHDCN).(*1*) The sampling frame for the Longitudinal Cohort Study is based on 1990 U.S. Census tract data for Chicago, which were used to identify 343 neighborhood clusters ("NCs") – groups of 2-3 census tracts that contain approximately 8,000 people. Major geographic boundaries (e.g., railroad tracks, parks, freeways), knowledge of Chicago's local neighborhoods, and cluster analyses of Census data guided the construction of NCs so that they are relatively homogeneous with respect to racial/ethnic mix, socioeconomic status, housing density, and family structure. A 2-stage sampling procedure was used that included selecting a random sample of 80 of 343 Chicago NCs stratified by racial/ethnic composition (7 categories) and SES (high, medium, and low). The aim was to have an equal number of NCs in each of the 21 strata that varied by racial/ethnic composition and SES. This objective was well approximated with only 3 exceptions—low-income primarily European American, high-income primarily Latino, and high-income Latino/African American neighborhoods did not exist. About one-third of NCs had mixed racial/ethnic compositions SES.

Within these 80 NCs, children falling within 7 age cohorts (ages: 0, 3, 6, 9, 12, 15, and 18) were sampled from randomly selected households. This effort led to

screening over 40,000 households to obtain the desired sample. Dwelling units were selected systematically from a random start within enumerated blocks. Within dwelling units, all households were listed and age-eligible participants (household members within twelve months of age 0, 3, 6, 9, 12, 15 or 18) were selected with certainty. As a result, multiple siblings were interviewed within some households. Participants are representative of families living in a wide range of Chicago neighborhoods (16% European American, 35% African American, and 43% Latino) and evenly split by gender. Extensive in-home interviews and assessments were conducted with the sampled children and their primary caregivers at 3 points in time over a 7-year period, at roughly 2 year intervals (wave 1 in 1995-1997, wave 2 in 1997-1999, and wave 3 in 1999-2002).

The second dataset, the Three City Study of Welfare, Children and Families is a survey of children in low-income families living in low-income neighborhoods from three cities, Boston, Chicago, and San Antonio.*(2, 3)* The study was designed to assess the well-being of low-income children and families in the period following welfare reform. The first stage of the sampling procedure involved the selection of 1990 Census block groups ranked by the percentage of children from four race/ethnic groups (Non-Hispanic white, Non-Hispanic African-American, and Hispanic of any race) in families with income below the federal poverty line. A cutoff point for percentage poverty was used to identify block groups with high-poverty among each of the four race/ethnic groups.

In the second stage, lists of dwelling units within the selected block groups were constructed, units were visited and eligibility was determined. Eligibility was based on whether the family had income below 200 percent of the federal poverty line, was female

or couple headed, and had a child from age 0 to 4 or 10 to 14 present. Eligible families were subsampled at varying rates based on several characteristics designed to obtain "suitable sample yields for analysis."(*3*) Among selected families, one child was selected as the focal child along with the primary caregiver. The baseline survey of 2,402 focal children and caregiver pairs was conducted between March and December of 1999, and a second wave of interviews with 2,158 focal children was conducted between September 2000 and April 2001. A third wave of interviews was conducted between Februrary 2005 and January 2006 but is not included in the file used for the analysis.

Definitions of geographic boundaries

Neighborhoods are operationalized using three successively larger boundaries: block groups, census tracts, and neighborhood clusters. Block groups are contiguous clusters of blocks within census tracts, and contain between 600 and 3,000 residents, with an average of roughly 1,500 residents. Census tracts, the most commonly used boundary for neighborhood studies, are small geographic areas designed to be relatively homogenous in terms of population demographic and economic characteristics. Tracts contain between 1,500 and 8,000 residents, with an average population of roughly 4,000 residents. Tracts and block groups are used by the Census Bureau for tabulating and presenting data on small geographic areas.(*4*) Neighborhood clusters were developed by researchers from the PHDCN to represent neighborhoods in Chicago. Neighborhood clusters are composed of groups of geographically contiguous census tracts that are similar in terms of demographic and economic composition, and are constructed to contain roughly 8,000 residents.(*5*)

PHDCN analysis details and results from alternative specifications

Results from specifications shown in the main text in Figures 1 through 4 are based on a pooled sample of PHDCN assessments conducted over three interview waves. There are two complications that arise from using the pooled data. First, individuals appear in the data at multiple points if they were assessed in more than one survey wave. To adjust standard errors for possible clustering of error terms within individuals assessed more than once, all results reported in the main text use the Huber/White sandwich estimator. The second complication is that data are not available at Waves 2 and 3 for some sample members due to attrition from the survey or residential mobility out of Chicago (because homicide data are only available within the city). Analyses were conducted using two additional analytic approaches to assess the robustness of main results to these complications.

One alternative approach is to use only responses from Wave 1 of the PHDCN survey. This approach reduces power to detect effects of local homicides, but avoids the complications arising from having multiple observations of the same individual in the dataset, and avoids complications arising from attrition from the survey or residential mobility outside of Chicago. Figures S1 (WISC-R scores) and A2 (WRAT3 scores) reproduce the results from Figures 1 and 2 in the main text, using only Wave 1 of the PHDCN in place of the pooled sample. While the standard errors are slightly larger than in the specification from the pooled sample, the estimated effects are larger in magnitude when using the Wave 1 sample. Estimated effects of homicides occurring within a week of the WISC-R assessment are stronger than those reported in Figure 1, as are all

estimated effects of homicides on WRAT3 scores. In the Wave 1 sample, the effects of homicides occurring in the tract and neighborhood cluster within a week of the assessment on WRAT3 scores are large and statistically significant.

A second alternative approach is to pool data from all three waves and adjust for nonrandom attrition and nonrandom mobility out of Chicago. To carry out this approach two sets of weights were developed, the first representing the inverse probability of attrition, the second representing the inverse probability of mobility outside Chicago. In each case, selection models predicting attrition and mobility out of Chicago were derived from prior research using the PHDCN.(*6, 7*) The product of the weights are applied to the data at Waves 2 and 3. Results from models predicting attrition at Waves 2 and 3 are displayed in Table A3, and results from models predicting mobility out of Chicago are displayed in Table A4. Figures S3 (WISC-R scores) and A4 (WRAT3 scores) reproduce the results from Figures 1 and 2 in the main text, but using a weighted sample that adjusts for observable predictors of both attrition and mobility out of Chicago. Results from the weighted sample are extremely similar to the main results, with no substantive differences in effect sizes.

Results for Hispanics

Figures S5 and S6 display results from the PHDCN when the sample is limited to Hispanics. Point estimates fluctuate around zero and have wide confidence intervals, meaning it is not possible to reject the null hypothesis of no effects. For each subtest, only one point estimate out of 15 is significant, and there is no clear pattern suggesting

that temporal proximity of the homicide and the assessment or geographic proximity to the homicide is related to the impact of the homicide on cognitive performance.

Analysis of heterogeneity in caregiver and child characteristics among exposed and non-exposed African-American children

Figure S7 shows the "effect" of exposure to a homicide within four days of the interview on caregiver/family characteristics and on the child's self-reported violent behavior. Figure S8 shows the effect of exposure within seven days of the interview. Under the assumption of exogenous variation in the recency of local homicides among children living within the same neighborhood, the results should show no systematic heterogeneity in caregiver characteristics or child violence.

To test this assumption the figures show estimates from several conditional logit fixed effects specifications with tract by survey wave fixed effects and calendar month and year fixed effects. Low family income is an indicator for caregiver-reported membership in the lowest two income categories, meaning the family earned less than $10,000 anually. Low caregiver education indicates that the caregiver has less than a high school diploma. Caregiver marital status indicates that the caregiver is married. Child violence is an indicator for any self-reported violent behavior, and is based on an assessment in which children were asked whether they had taken part in any of twelve violent activities in the prior year. All variables are coded as dichotomous measures, and are analyzed with conditional logit fixed effects estimators.

Figures S7 and S8 provide no evidence suggesting systematic heterogeneity in caregiver or family characteristics among children who are and are not assessed within a

short period following a local homicide, and there is no difference in children's self-reported violence.

References

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5. R. Sampson, S. Raudenbush, F. Earls, *Science* **277**, 918 (1997).
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Table S1. Descriptive statistics from the PHDCN and Three City Study samples.

	PHDCN		Three City Study Chicago Sample	
	African Americans	Hispanics	African Americans	Hispanics
Sample size	1,162 (35%)	1,546 (47%)	391 (52%)	320 (42%)
WISC-R (sd)	7.81 (2.92)	7.20 (2.87)	95.29 (16.72)	101.06 (20.22)
WRAT3 (sd)	94.09 (18.44)	94.57 (20.20)	90.86 (17.30)	95.34 (17.17)

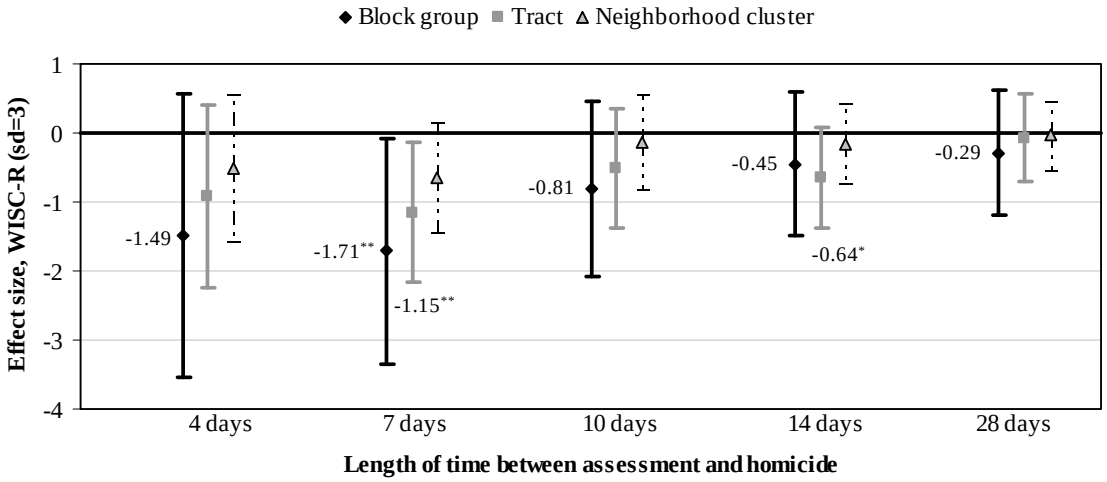

Figure S1. Results using PHDCN Wave 1 only, WISC-R. Effect on WISC-R scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African-Americans only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

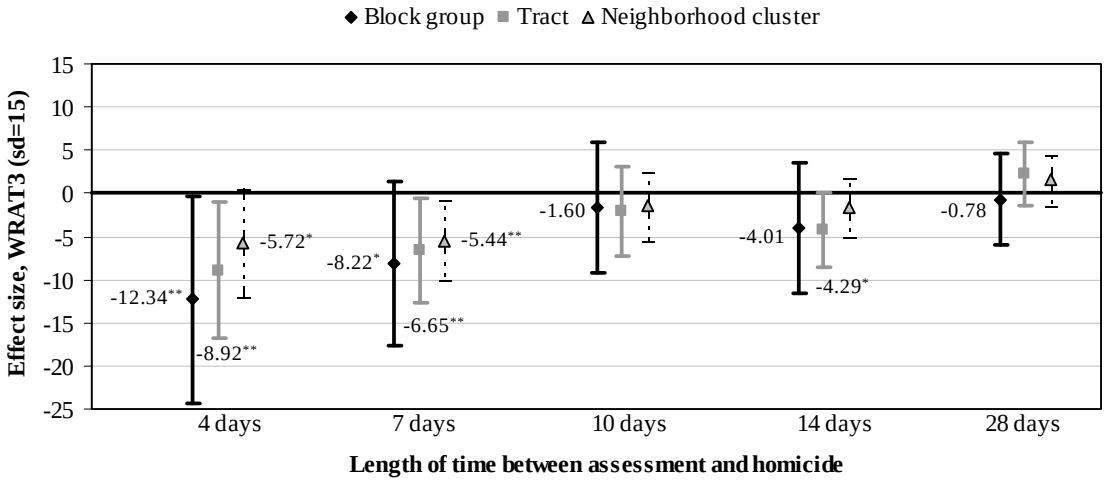

Figure S2. Results using PHDCN Wave 1 only, WRAT3. Effect on WRAT3 scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African-Americans only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

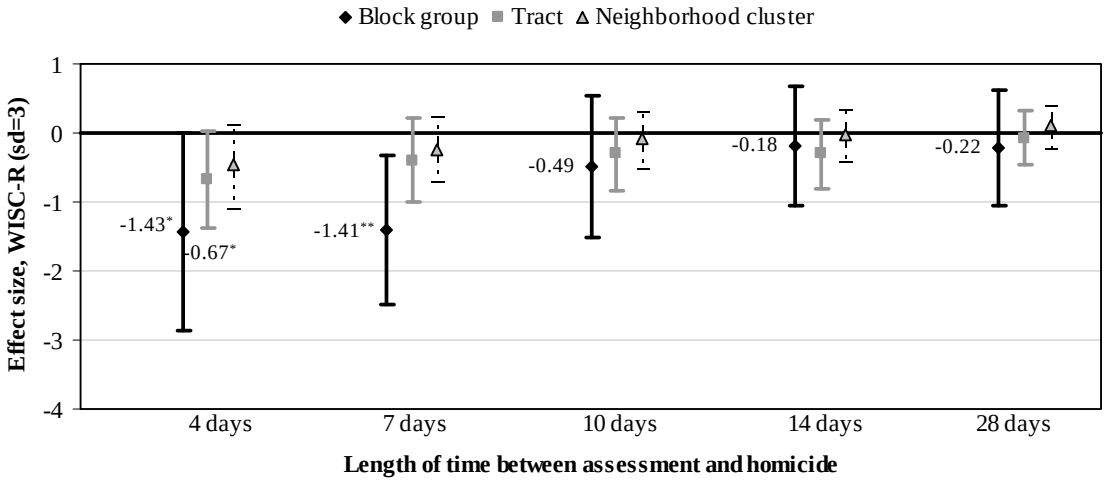

Figure S3. Weighted results, WISC-R. Effect on WISC-R scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African-Americans only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

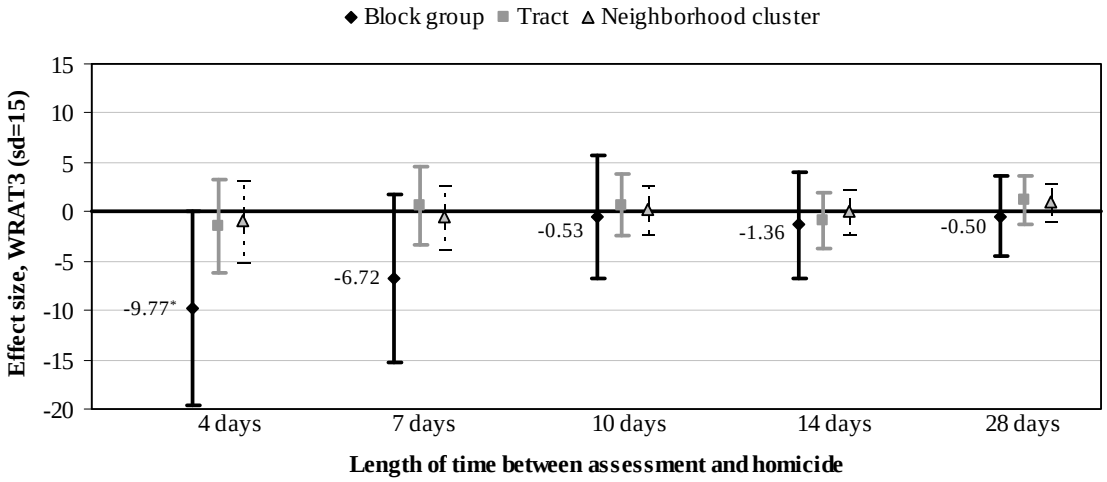

Figure S4. Weighted results, WRAT3. Effect on WRAT3 scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, African-Americans only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

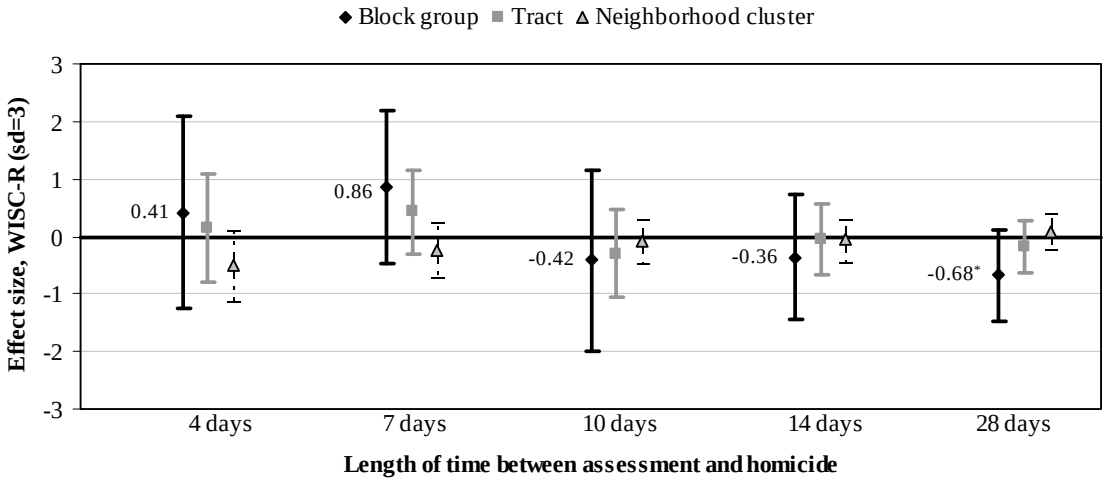

Figure S5. Hispanics results, WISC-R. Effect on WISC-R scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, Hispanics only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

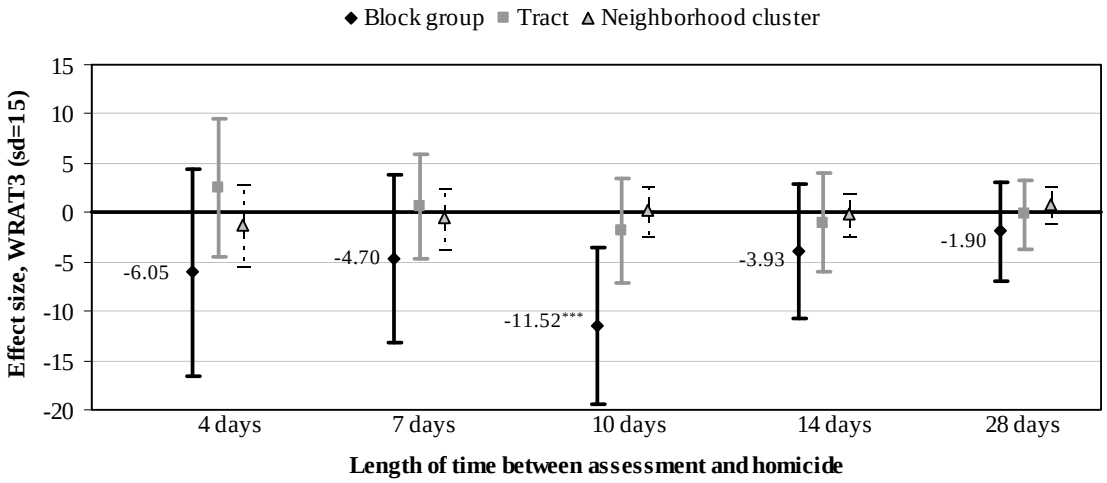

Figure S6. Hispanics results, WRAT3. Effect on WRAT3 scores of a recent homicide occurring within the block group, census tract, or neighborhood cluster, Hispanics only. PHDCN, n=1,111. *** = p<.01; ** = p<.05; * = p<.10. Coefficient values are shown for all block group estimates and for significant estimates at all levels.

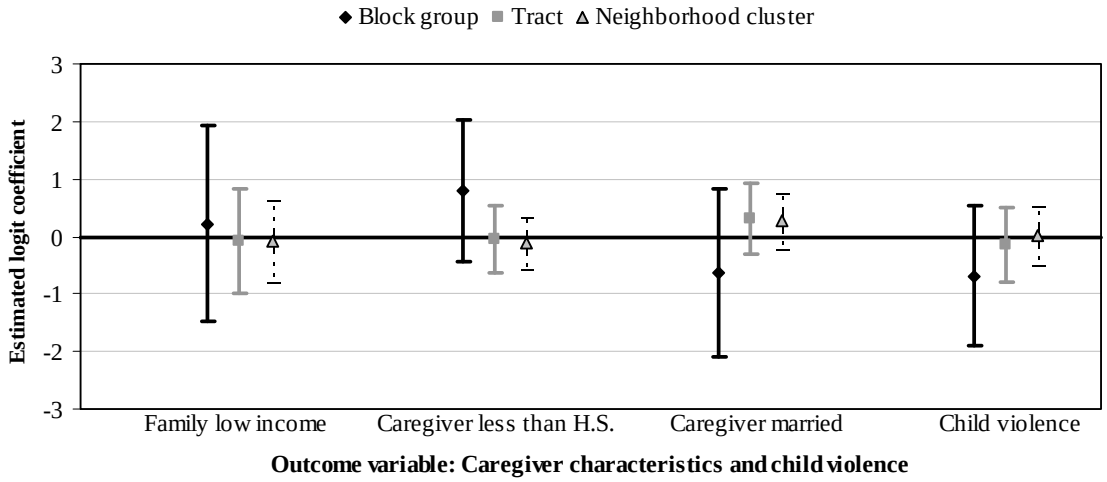

Figure S7. Heterogeneity among African-American children and families exposed and not exposed to a local homicide within four days of the assessment. Effects on caregiver characteristics and child violence of a homicide occurring with four days of the interview assessment. Results shown for homicides occurring within the block group, census tract, or neighborhood cluster, and for African-Americans only. No coefficients are significant at $p<.10$.

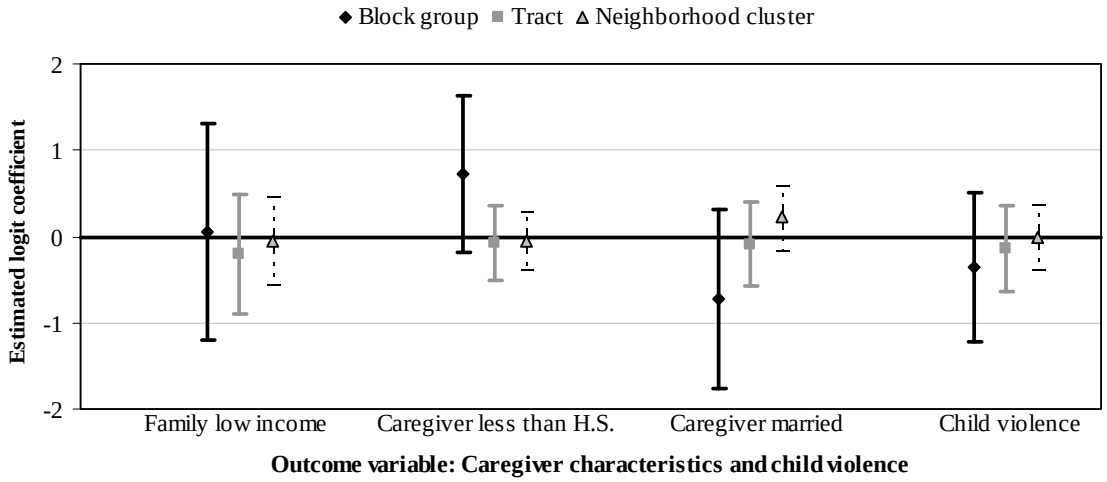

Figure S8. Heterogeneity among African-American children and families exposed and not exposed to a local homicide within seven days of the assessment. Effects on caregiver characteristics and child violence of a homicide occurring with seven days of the interview assessment. Results shown for homicides occurring within the block group, census tract, or neighborhood cluster, and for African-Americans only. No coefficients are significant at $p<.10$.