A Spatio-Temporal Assessment of Exposure to Neighborhood Violence

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The past two decades has been marked by a renewed interest in studying the effects of neighborhood settings on various social phenomena like crime, educational attainment, mortality, and morbidity, yet the bulk of 'neighborhood effects' research examines the impact of neighborhood context cross-sectionally. However, from a public policy standpoint, it is critical to understand whether the effects of neighborhood context are situational, or whether they operate via the accumulation of exposure to neighborhood-level risks and opportunities. For example, findings from the Moving to Opportunity (MTO) housing mobility experiment indicate that moving male youth out of impoverished neighborhoods has no effect on mental health and educational outcomes, and actually leads to more risky behavior (i.e., arrest for property crime, drug and alcohol use) and more physical health problems (Kling, Leibman, and Katz 2007; Kling, Ludwig, and Katz 2005). These findings suggest that changing individuals' neighborhood environment does not immediately lead to healthier outcomes. Perhaps this results because the influences of past neighborhood settings endure for some, even if individuals are able to move to a different neighborhood.

For this study, we take seriously the notion that there are cumulative consequences of being exposed to deleterious neighborhood conditions. In particular, we focus on the consequences of exposure to neighborhood violence. Instead of examining exposure to violence at a single time point, however, we prospectively assess the duration of exposure to neighborhood violence for a sample of youth. Neighborhood violence is often regarded as an

outcome variable in research (e.g., Sampson, Raudenbush, and Earls 1997; Kirk and Papachristos 2011), yet it is also true that neighborhood violence is a causal mechanism that both directly and indirectly affects individual-level outcomes, particularly physical and mental health. For example, neighborhood violence is a stressful condition which has detrimental health consequences for pregnant women and newborn babies. Morenoff (2003) finds that exposure to neighborhood violence is significantly related to low birth weight, and that neighborhood violence mediates the association between neighborhood poverty and birthweight. Harding (2010) observes neighborhood violence is a daily reality for many boys in many inner-city neighborhoods. In turn, neighborhood violence influences the composition of peer social networks and influences individuals' identity and their movements outside of their home neighborhood. There is a racial component to these consequences of violence. Because exposure to neighborhood violence is greatest among minority groups, the adverse consequences of repeated exposure to violence are concentrated among poor, minority households.

The analytic questions guiding our study are as follows: is there inequality in the duration of exposure to neighborhood violence across racial and ethnic groups, and, if so, what explains differences in exposure to violence across groups? We hypothesize that, compared to their white and Latino peers, black youth can expect to spend a much longer share of childhood in high-violence neighborhoods, even after controlling for family structure and socioeconomic status. We also hypothesize that the likelihood of transitioning (i.e. moving) out of a violent neighborhood is significantly lower for black youth than for other youth.

To test these hypotheses, we estimate racial and ethnic inequality in the duration of exposure to high- and low-violence neighborhoods, accounting for race-ethnic differences in socioeconomic status, family structure, and neighborhood conditions. We perform a series of

descriptive and inferential analyses on a merged data repository which includes the following datasets: 1) the PHDCN Longitudinal Cohort Study, 2) the 1994-1995 PHDCN Community Survey, 3) the 1990 and 2000 U.S. Census, and 4) 1994-1998 violent crime data obtained from the Chicago Police Department.

Methodologically, we construct covariate-adjusted increment-decrement period life tables in order to estimate racial and ethnic inequality in the duration of children's exposure to neighborhood violence throughout childhood. This method follows that described in Timberlake (2009), who used data from the Panel Study of Income Dynamics to estimate durations of exposure to neighborhood poverty for black and Latino children. In brief, this method uses multinomial logistic regression to estimate probabilities of birth into and probabilities of transition between life states, in this case, subjective and objective neighborhood violence. These probabilities are then inputted into a standard life table construction procedure, again explained fully in Timberlake (2009). The resulting life tables provide information on children's expected duration in the two measures of neighborhood violence, and the effects of family and neighborhood characteristics on those durations.

The tables and figures below present some preliminary findings, based on the use of two measures of neighborhood violence. Our *subjective* measure involves children's and their caregivers' answers to questions about the extent to which children, within the previous year, saw someone attacked by a knife, saw someone get shot, or heard a gunshot. This variable is scored 1 if a child never experienced any of these, 2 if he or she experienced one to three, and 3 if he or she experienced 4 to 12 of these events. Our *objective* measure comes from Chicago Police Department violent crime data. We first created a variable measuring the rate of violent crimes per 1,000 persons as the sum of homicides, robberies, and aggravated assaults in each child's census tract during the year they lived in that tract (i.e., either 1995 or 1997). We then

split this variable into a three-category dependent variable indicating low, medium, and high crime.

Figures 1 and 2 and Table below present some preliminary findings from our analysis. Figures 1 and 2 are not adjusted for any covariates; hence, they represent the amount of time (measured as the percentage of childhood from birth to exact age 18) that children can expect to spend in the three neighborhood violence types, measured subjectively and objectively as noted above. Note that, in contrast to their black and Hispanic peers, white children can expect to spend the vast majority of childhood, nearly 80%, in neighborhoods where they were not exposed to any violence in a subjective fashion. By contrast, black children can expect to spend less than half of childhood in such a neighborhood, and over 10% of childhood in neighborhoods with high levels of subjectively-experienced crime.

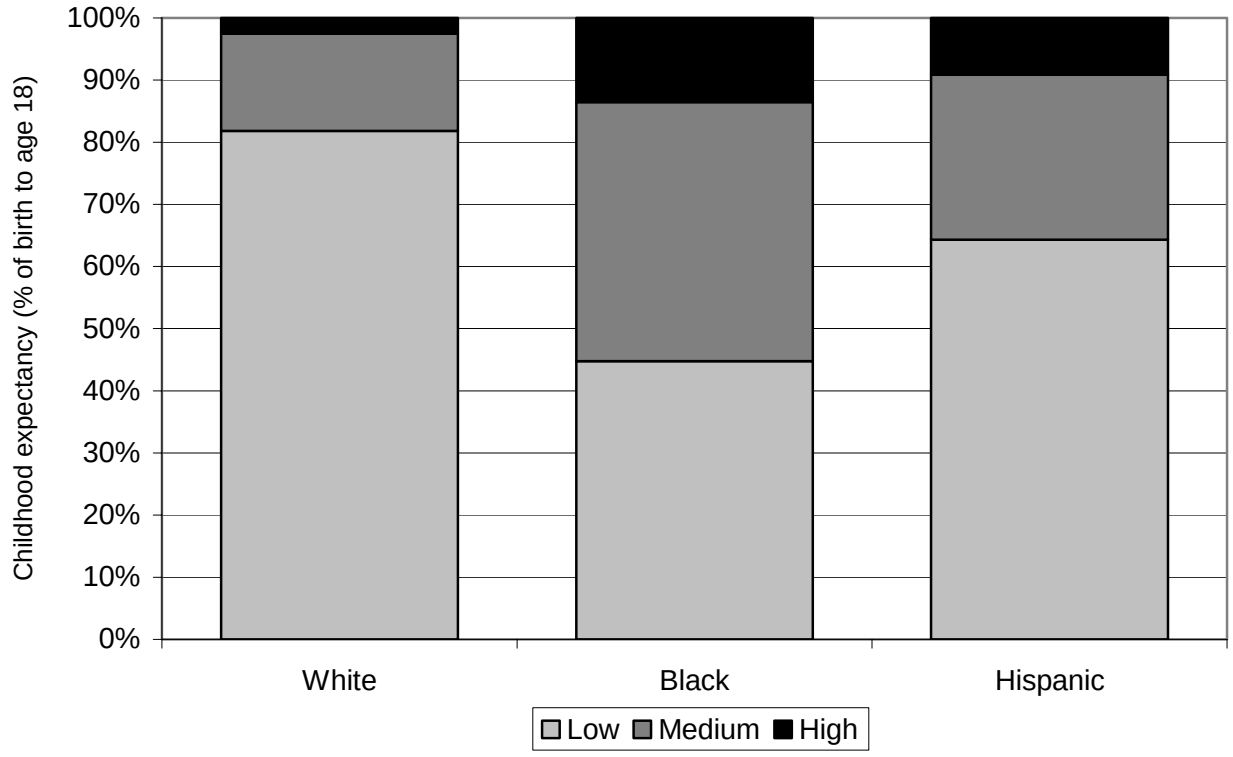

Figure 1. Unadjusted Childhood Expectancy in Subjective Exposure to Neighborhood Violence, by Child Race/Ethnicity: PHDCN Children, 1995-1997

In terms of objective exposure to crime, Figure 2 again demonstrates severe levels of racial and ethnic inequality in such exposure. Again, white children can expect to spend about 80% of their childhood in the lowest crime type, compared to 10% for black children and 30% for Hispanic children. Our preliminary findings indicate that black children can expect to spend fully half of childhood in neighborhoods in the highest violent crime rate category, compared to less than 10% for white and 30% for Hispanic children.

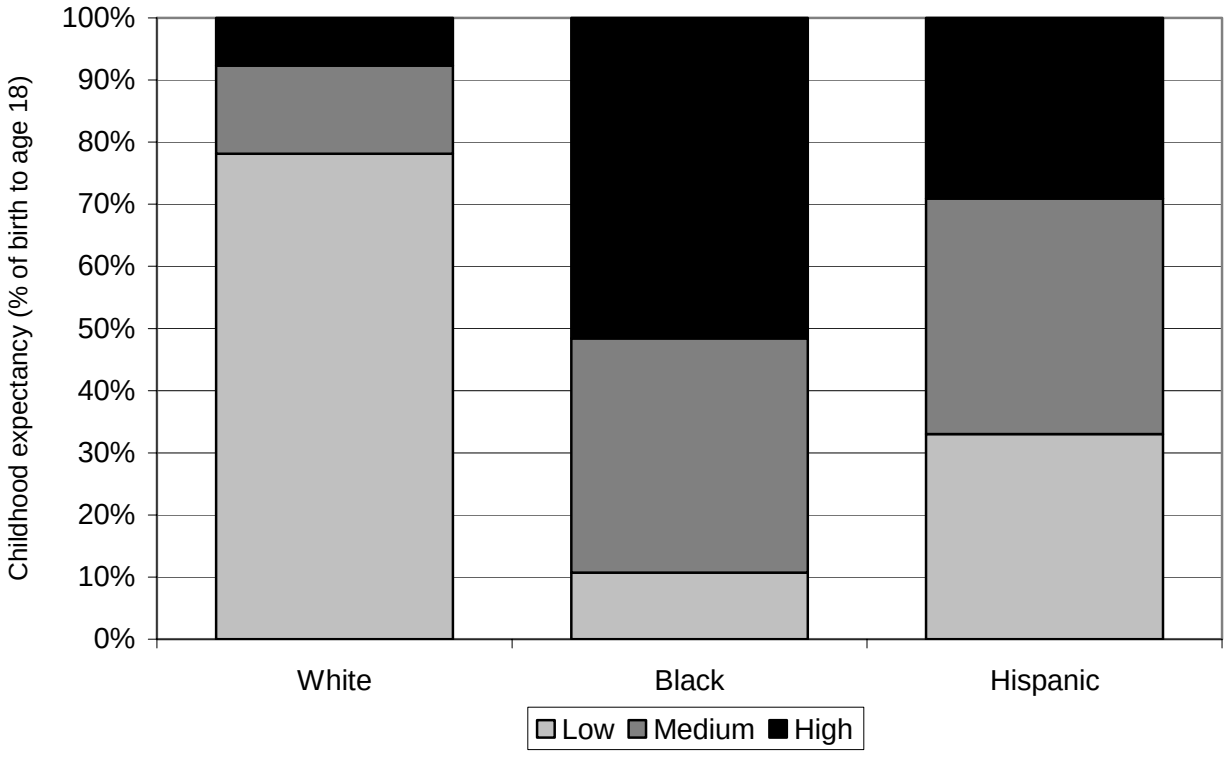

Figure 2. Unadjusted Childhood Expectancy in Objective Exposure to Neighborhood Violence, by Child Race/Ethnicity: PHDCN Children, 1995-1997

In future drafts of this paper, we will explore the extent to which these stark levels of inequality are explained by racial/ethnic differences in household and neighborhood characteristics. Based on the results in Timberlake (2009), we expect household characteristics to explain a smaller share than neighborhood characteristics. We are especially interested in

comparing the results for blacks and Hispanics, since data limitations precluded Timberlake from an examination of Hispanic patterns.

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