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The Long Reach of Violence: A Broader Perspective on Data, Theory, and Evidence on the Prevalence and Consequences of Exposure to Violence

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Abstract

In this review, I argue for a broader perspective on exposure to violence, one that extends beyond victimization and direct witnessing of violence to consider exposure to violent situations and violent residential environments. The first part of the review focuses on the measurement of exposure to violence. I review national estimates of prevalence and trends in victimization and direct exposure to violence and describe novel forms of data measuring violent situations and violent environments. The second part of the article reviews theory and evidence on the consequences of exposure to violence. I discuss the theoretical and methodological problem of selection into violent situations and environments and describe several studies that directly address each problem through theory, data collection, and research design. I conclude with a call for a broader conceptualization of exposure to violence, and an expanded, more creative set of methods to measure and identify the long reach of violence.

INTRODUCTION

The impact of an incident of violence is felt most directly by the individual victim, but it is not limited to that victim. The incident affects those who are present when it occurs and watch it unfold. The impact may extend further, to those who know the victim or perpetrator, to those connected through some affiliation to the actors involved (e.g., family, friend, classmate, ethnic group, gang, neighborhood), and to those in the community who become aware of the incident. That same incident may affect those who are completely unaware of what took place but who walk streets that have a greater police presence, enter schools through metal detectors, and look for jobs in places where business owners are reluctant to open shop.

Violence has a long reach. Although this is not a novel insight, it is an observation that is often overlooked, or given minimal attention, in the literature on exposure to violence (ETV). Buka et al. (2001) identify three levels of ETV. Primary exposure refers to direct victimization, secondary exposure refers to violence that is seen or heard directly, and tertiary exposure refers to violence that is communicated to an individual. Although this classification is useful, I argue that it is incomplete. A growing body of evidence suggests that the consequences of violence extend well beyond those who are victimized and those who see or even hear about an act of violence (Sharkey & Sampson 2015). Violence happens to people, but it also happens to places. By implication, the study of ETV should be carried out not only at the level of individuals and families but also at the level of streets and intersections, communities, schools, and cities. Violence is experienced by some purely because of where they live, but it is much more common among those who select into networks of people more likely to engage in violence and into settings and situations where violence is more common. Thus, the study of ETV has to begin with theory and evidence on selection processes.

In this review, I argue for a broader perspective on ETV. I make a distinction between exposure to (*a*) violent interactions, which encompasses victimization and direct witnessing of violence, the typical objects of study in the literature on ETV; (*b*) violent environments, by which I mean residential environments that have high levels of violence, regardless of whether an individual witnesses it in person or hears about it; and (*c*) violent situations, by which I mean specific locations and times when violence is more likely, regardless of whether a violent interaction takes place. I argue for greater attention to exposure to violent situations, interactions, and environments as an outcome of study and for more creative and rigorous methods to identify the impact of exposure to all three forms of violence.

The first part of the review focuses on the measurement of violence, reviewing what is known about prevalence and trends and highlighting new methods to measure children's exposure to violent situations. The second part of the review shifts to theory and evidence on variations in ETV and their consequences.

MEASURING THE LONG REACH OF VIOLENCE

The vast majority of research on ETV focuses on what Buka et al. (2001) refer to as primary and secondary exposure and relies heavily on survey items that ask individuals about victimization or witnessing of violent acts to measure the prevalence of ETV. But to capture the long reach of violence requires going beyond population surveys to consider data from police departments, health statistics centers, and hospitals to assess prevalence and trends in exposure to both incidents of violence and environmental violence. The various sources of data available do not provide a single clear answer about the prevalence of violence, but they do reveal a remarkable transformation that has taken place in the modern history of urban America, as well as continuing disparities in exposure to homicide and community violence. They also reveal the limitations of existing data on violence.

I also bring attention to a new set of methods and data sources that allow for a different perspective on how violence in the environment becomes salient in individuals' lives. The new forms of data, in combination with administrative data that are rapidly becoming available at a local level, allow for a shift in the study of ETV—instead of focusing only on exposure to incidents of violence, these new data sources bring us closer to the measurement of exposure to both violent environments and violent situations.

Prevalence and Trends in Exposure to Violent Interactions

Homicide victimization. Homicide is the most extreme form of violent victimization and is measured most reliably (Mosher et al. 2010). Levels and trends in the homicide rate are most commonly derived from the FBI Uniform Crime Reporting (UCR) system, which is an aggregation of data reported by police departments. The UCR system has been in place since 1930 and has become a more accurate source of information on homicide over time (US Dep. Justice 2014). Homicide is also tracked by state offices of vital statistics, which rely on the reports of coroners and medical examiners to tabulate the cause of every death that takes place within the United States. State reports are aggregated by the National Center for Health Statistics (NCHS) (Zahn & McCall 1999).

Although the absolute number of homicides reported by the FBI and the NCHS never align exactly, trends in the murder rate derived from police departments and aggregated by the FBI track closely with trends derived from medical reports gathered by state health departments and the NCHS (e.g., see Donohue & Wolfers 2005). **Figure 1** displays trends in the homicide rate from 1991 through 2015 using both sources of data. Although the two sources of data on homicide mirrored each other almost perfectly in the 1990s, in recent years the homicide rate from the NCHS is slightly higher than that reported by the UCR. In 2015, for instance, there were 17,525 homicides according to the NCHS, for a rate of 5.6 per 100,000 (Natl. Cent. Health Stat. 2017). According to the UCR, there were 15,192 homicides in 2015, for a rate of 4.9 per 100,000 (Fed.

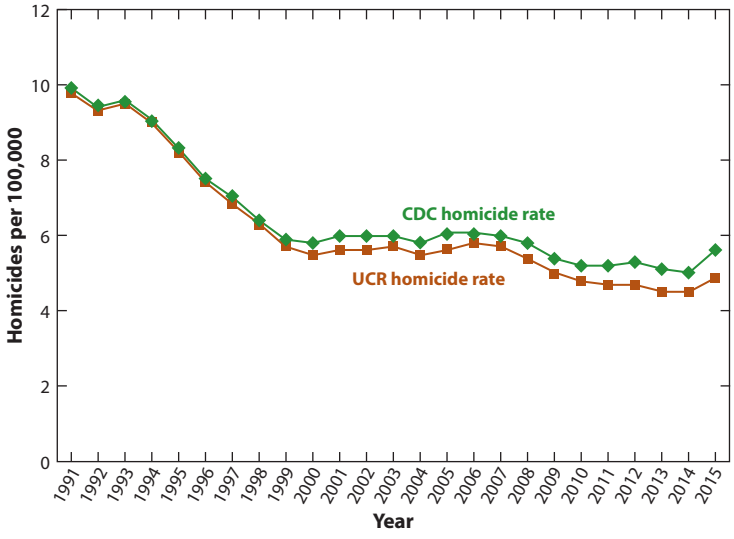

Figure 1

Homicides per 100,000 from 1991 to 2015 from the Uniform Crime Reports (UCR) (Fed. Bur. Investig. 2017) and the Centers for Disease Control and Prevention (CDC) (Natl. Cent. Health Stat. 2017).

Bur. Investig. 2015). The two sources indicate that the homicide rate has fallen between 43% and 50% from 1991 through 2015.

Homicide is uncommon among children, but rates of homicide victimization rise rapidly in the late teenage years. In 2015, the homicide victimization rate for children under 18 was 1.48 per 100,000 according to data from the UCR. Homicide victimization rates vary sharply by gender and race/ethnicity. Based on UCR data, the homicide rate for males as of 2015 was 6.52 per 100,000, compared to 1.68 per 100,000 females. The homicide rate for African Americans (Hispanic and non-Hispanic) was 15.2 per 100,000, the rate for all Hispanics was 3.47 per 100,000, and the rate for whites (Hispanic and non-Hispanic) was 2.29 per 100,000.

Violent crime victimization. Data on less extreme forms of violence are available from police departments through the UCR, from national household surveys, and from hospital emergency room records. According to data on all violent crime from the UCR (murder and nonnegligent manslaughter, robbery, rape, and aggravated assault), there were 1,160,664 violent crimes in 2015, for a rate of 373 violent crimes per 100,000 (Fed. Bur. Investig. 2015). Similar to the homicide rate, the violent crime rate in the UCR has fallen by roughly 50% since 1991. Figures on violent crime victimization are not available by gender, race/ethnicity, or age, so it is not possible to provide more detailed statistics on violent victimization using this data source.[1]

The National Crime Victimization Survey (NCVS) provides information on violent victimization experienced over the prior six months by a national sample of Americans age 12 and older (Bur. Justice Stat. 2017). Data from the NCVS show that the rate of serious victimization (robbery, aggravated assault, and sexual assault/rape) has fallen by 77% from 29.1 per 1,000 in 1993 to 6.8 per 1,000 in 2015. The rate of serious violent victimization is slightly higher for young people age 12–18 but has also fallen further. In 1993, the serious violent victimization rate was 63 per 1,000 12–18-year-olds and had dropped to just 8 per 1,000 in 2015, a decline of 87%.

In the early 1990s, there were substantial racial and ethnic gaps in serious victimization, but these gaps have narrowed over time. The rate of serious victimization for non-Hispanic African Americans in 2015 was 8.4 per 1,000, compared to 7.1 per 1,000 for Hispanics and 6.0 per 1,000 for non-Hispanic whites. The gender gap in serious violent victimization has also mostly disappeared over time. In 1993, the rate of serious violent victimization was 31% higher for males than females. Rates of serious victimization for both men and women have plummeted, and from 2013 to 2015 there has been no consistent gender difference in serious victimization rates.

A third source of data on victimization is the National Survey of Children's Exposure to Violence (NATSCEV), a nationally representative telephone survey that has now gathered three cross-sectional waves of data spanning from 1997 to 2014 (Finkelhor et al. 2015b). Measures of victimization are based on the Juvenile Victimization Questionnaire (JVQ), which reports on five different forms of victimization and ETV: criminal victimization, maltreatment, victimization by peers and siblings, sexual victimization, and ETV. Parents provide responses for children age 0 to 9, and interviews are conducted directly with children age 10 to 17. The survey is designed to allow for estimates of the prevalence of different forms of victimization in the past year and over the child's lifetime.

Self- or parent-reported data collected from late 2013 to early 2014 show that 37% of children 0–17 have experienced a physical assault in the past year, and 52% have experienced an assault during their lifetime (Finkelhor et al. 2015a). Approximately 4% of children were assaulted with a

[1]I should note that it is possible to analyze arrest rates, but not victimization rates, by age, gender, and race/ethnicity. Given the focus on victimization and exposure, I have not done so in this review.

weapon in the past year, 5% were victims of sexual assault, and 7% were victims of robbery. Over their lifetimes, 9% of children were victims of assault with a weapon, 8% were victims of sexual assault, and 12% were victims of a robbery.

Almost all forms of victimization are more common among males. Forty-two percent of males reported some form of physical assault in the past year compared to 33% of females. Whereas males and females are equally likely to report being assaulted by a sibling, males are almost twice as likely as females to be assaulted by a non-sibling peer.[2]

Nonfatal firearm victimization. Estimates of nonfatal injuries from firearm assaults are available from the National Electronic Injury Surveillance System (NEISS), which is based on a probability sample of hospital emergency departments across the United States (Fowler et al. 2015). In 2012, there were 17 victims of nonfatal firearm assaults per 100,000 people, a decline of 31% since 1993, the first year of available data. Among children age 0–17, the rate of nonfatal firearm assaults was 5 per 100,000, a decline of 68% since 1993 (US Dep. Health Hum. Serv. 2013).

An alternative measure of victimization with a firearm is available from the NCVS, which asks (among those who report being victimized) whether the offender had a weapon and, if so, whether it was a firearm (Bur. Justice Stat. 2017). Among the population 12 years and older, firearm victimization fell 85% from more than 7 per 1,000 in 1993 to just over 1 per 1,000 in 2015. The rate of firearm victimization fell almost 90% among 15–17-year-olds over this timeframe.

Gaps in firearm victimization by gender and by race/ethnicity differ substantially across the two sources of data. Data from the NEISS, which reflects victimization that led to hospitalization, indicate that the rate of nonfatal firearm victimization for males in 2012 was 10 times higher than that for females. In the NCVS, rates of victimization with a firearm for males and females were almost identical in the years leading up to 2015.

Similar discrepancies between the two data sources are present when firearm victimization is analyzed by race and ethnicity. According to data from the NEISS in 2012, the rate of hospitalization from firearm injuries for African Americans was close to 19 times higher than the rate for whites. According to data from the NCVS, firearm victimization was four times higher for African Americans than for whites. From 1993 to 2015, self-reported firearm victimization in the NCVS fell between 82% and 91% for non-Hispanic African Americans, non-Hispanic whites, and Hispanics. By 2015, the rate of nonfatal firearm victimization was 2.8 per 1,000 for non-Hispanic African Americans, 1.2 per 1,000 for Hispanics, and 0.7 per 1,000 for non-Hispanic whites.

The substantial differences between the two data sources may reflect issues related to the validity of self-reported victimization data from different segments of the population. However, the more likely explanation is that the two data sources measure very different forms of victimization. Whereas the NEISS captures shootings that lead to hospitalization, the NCVS asks whether the offender had a firearm during the victimization, but not whether it was used. Among individuals who report being the victim of a crime committed with a firearm in the NCVS, only approximately 10% report receiving any kind of medical treatment on-site or in a hospital.

Witnessing violence. Estimates of secondary ETV come from a wide variety of samples from different settings collected at different times, making it difficult to produce estimates of levels or change (Margolin & Gordis 2000). The NATSCEV allows for nationally representative estimates of the proportion of children age 0–17 who witness violent incidents directly (Finkelhor et al.

[2]It is possible to analyze variation in victimization by race/ethnicity with the NATSCEV, but the data are restricted and I have not found published tabulations by race/ethnicity.

2015a,b). In the latest wave of data collection, spanning from late 2013 to early 2014, approximately 25% of children reported witnessing any violence in the past year, and 38% reported witnessing violence over their lifetime. The data also provide estimates of direct exposure to specific forms of violence. For instance, 18% of children age 0–17 witnessed an assault in their community over the prior year, and 28% reported seeing an assault in their community at some point in their lifetime. A smaller percentage report witnessing firearm violence, as only 4% of children age 0–17 witnessed a shooting in the prior year, and 8% reported ever witnessing a shooting. Rates of witnessing violence in the community, including an assault or a shooting, are slightly higher for males than for females but are not significantly different.

Family violence. Data on intimate partner violence are available from the NCVS and the second wave of the NATSCEV, which asked a series of questions about children's exposure to parental victimization. Based on data from the NCVS, the rate of violent victimization perpetrated by intimate partners in the six months prior to the interview fell from 9.7 per 1,000 in 1993 to 3.0 per 1,000 in 2015, a decline of 69%.

The NATSCEV provides a different perspective by assessing children's exposure to their parents' violent victimization (Hamby et al. 2011). The survey found that 7% of children have been exposed in the prior year to a parent being the victim of physical violence (parent being assaulted, pushed, hit, kicked, choked, or beaten up by the partner), and 18% report ever being exposed to such physical violence. Among 14–17-year-olds, lifetime exposure to intimate partner physical violence was 29%.

When asked about both physical violence and emotional/psychological violence (verbal threats and displaced aggression, such as an object being thrown or broken or a wall being punched), 11% of all children reported exposure to parental intimate partner violence in the past year, and 26% reported ever being exposed to this form of violence. Among 14–17-year-olds, 14% reported exposure to parental physical or emotional/psychological victimization in the past year, and 40% reported ever being exposed. Among all children exposed to parental victimization, 90% reported witnessing the incident directly.

Summary of Prevalence and Trends in Exposure to Violent Interactions

Table 1 summarizes the range of estimates describing prevalence and trends in violent victimization and direct witnessing of violence, or what I have referred to as exposure to violent interactions. The results reveal the difficulty of making direct comparisons across the various sources of data because of the variety of approaches used to measure violence, the details of survey questions (e.g., exposure over the prior six months versus the prior year), the differences in samples of respondents, and the inconsistency in the timing and geographic coverage of data collection.[3]

Still, the collection of data sources allows for a crude set of summary statements about primary and secondary ETV in the United States. An initial conclusion is that violence remains a common feature of life throughout much of the United States. Survey data indicate that almost three out of every ten 14–17-year-olds have witnessed some form of physical violence among parents within the home, more than half of children report being the victims of an assault and 9% are assaulted with a weapon at some point during childhood. Young men continue to be victims of extreme violence (homicides and nonfatal firearm hospitalization) at much higher rates than young women, and racial and ethnic disparities in exposure to these forms of extreme violence remain severe.

[3] See Stein et al. (2003) for an overview of data sources used to study ETV through the end of the 1990s.

Table 1 Summary of levels, trends, and gaps in violence

Type of violence	Data source	Prevalence	Trend	Children	Gender	Race/Ethnicity
Homicide victimization	Uniform Crime Reports	4.9 per 100,000	50% decline (1991–2015)	1.48 per 100,000 for 0–17-year-olds	Rate for males is 3.9 times rate for females	Rate for African Americans is 6.6 times rate for whites
	Centers for Disease Control and Prevention	5.5 per 100,000	43% decline (1991–2015)	NA	NA	NA
Violent crime victimization	Uniform Crime Reports	373 per 100,000	50% decline (1991–2015)	NA	NA	NA
	National Crime Victimization Survey (NCVS)	6.8 per 1,000 (over previous 6 months)	77% decline (1993–2015)	8.0 per 1,000 12–18-year-olds	No gap	Rate for African Americans is 1.4 times rate for whites
	National Survey of Children's Exposure to Violence (NATSCEV)	NA	NA	37 per 100 0–17-year-olds	Rate for males is 1.3 times rate for females	NA
Nonfatal firearm victimization	National Electronic Injury Surveillance System	17 per 100,000 in 2012	31% decline (1993–2012)	5 per 100,000 0–17-year-olds	Rate for males is 10 times rate for females	Rate for African Americans is 19 times rate for whites
	NCVS	1.1 per 1,000 in 2015	85% decline (1993–2015)	NA	No gap	Rate for African Americans is 4 times rate for whites
Witnessing violence	NATSCEV	NA	NA	25 per 100 0–17-year-olds	No significant gap	NA
Family violence	NCVS	3 per 1,000	69% decline (1993–2015)	NA	NA	NA
	NATSCEV	NA	NA	7 per 100 0–17-year-olds	No significant gap	NA

Abbreviation: NA, not available or not calculated.

The rate of homicide victimization for African Americans is more than six times as high as for whites and more than four times as high as for Hispanics. The rate of hospitalization for nonfatal firearm injuries is ten times higher for African Americans than for whites.

Despite the prevalence of violence in the lives of children, there has been tremendous, almost unthinkable change in just about every form of violence since the early 1990s. Data on homicide and violent crime reported by police departments and health departments indicate that violence has been cut roughly in half, but self-report data on victimization suggest an even sharper decline. Serious victimization among young people has declined by almost 90% since the early 1990s. Violence is still a common feature of daily life for some segments of the population, but its prevalence is nothing like it was just twenty-five years ago.

Measuring Exposure to Violent Environments and Violent Situations

Although it is possible to generate this basic summary from existing data sources, the limitations of most measures of ETV have stunted scholarly understanding of the myriad ways in which individuals' lives are affected by violence in their environments. Most of the quantitative literature on ETV relies on self-reported data from surveys asking children whether they have personally been victimized or witnessed violence in person. Although there is evidence for the reliability of such measures (e.g., see Selner O'Hagan et al. 1998), data from other sources beyond self-reported survey items have the potential to provide a more expansive view of how violence within children's environments disrupts their daily lives, even if they do not report it and even if they do not see it in person. At this point, however, little is known about the degree of violence in children's residential environments and how exposure to environmental violence has changed over time.

The most comprehensive data set available for the study of violence in individuals' residential environments is the National Neighborhood Crime Study (NNCS), which gathered data on crime at the level of census tracts from 91 cities with populations over 100,000 as of 2000 (Peterson & Krivo 2010a,b). To measure individuals' ETV in their neighborhoods one can use the national data on census tracts and weight it by the number of individuals from different backgrounds in each tract, similar to an exposure index of racial segregation. Analysis of data from the NNCS indicates that the average individual living in one of the largest US cities experienced 1.7 total neighborhood homicides over the three years spanning 1999 to 2001, an annual rate of 0.13 per 1,000 neighborhood residents. Exposure to environmental violence was much more common for black Americans than for other racial and ethnic groups. The average black American experienced 3.35 neighborhood homicides from 1999 to 2001, for an annual rate of 0.28 annual homicides per 1,000 neighborhood residents.

Few studies have analyzed trends in environmental violence at the neighborhood level. The most comprehensive study analyzed census tract data for at least a decade in six cities, selected because of data availability rather than representativeness (Friedson & Sharkey 2015). Neighborhood violent crime rates fell between 12% (in Philadelphia) and 46% (in St. Petersburg, FL) in the six cities. In all these cities, violent crime dropped more, in both absolute and proportional terms, in high-poverty neighborhoods than in the rest of the city. The absolute number of crimes also fell more in predominantly African-American neighborhoods of each city than in predominantly white neighborhoods. African-American neighborhoods experienced a larger proportional decline in violence compared to majority-white neighborhoods in four of the six cities, with Chicago and St. Petersburg being the exceptions.

The absence of continuous, comprehensive data on violence at the neighborhood level is perhaps the most glaring obstacle to developing a complete picture of exposure to violent environments. Fortunately, these data are rapidly becoming public and more easily accessible.[4] Efforts to collect data on neighborhood-level violence, on a continuous basis and from multiple sources, are essential to developing better evidence on prevalence and trends in exposure to violent neighborhood environments.

Of course, administrative sources of data also come with limitations. When using administrative data, the treatment under study is less clear because it includes some incidents of violence that a child may see in person, some that the child is aware of, and others that may have no bearing

[4] A public database of incident-level data on shootings was recently gathered on a public website and published by *The Guardian*, revealing how slow the academic community has been to gather and use these newly available data from across the country. See **http://www.gunviolencearchive.org/** and **https://www.theguardian.com/world/2017/mar/20/mapping-gun-murders-micro-level-new-data-2015**.

at all on the child's life. Further, the boundaries used to define an individual's neighborhood or residential environment may not align with the locations that are most salient in the individual's life (Matthews & Yang 2013, Sharkey & Faber 2014).

For these reasons, advances in the measurement of exposure to violent environments are not sufficient to capture the lived experience of community violence, and new measures of exposure to violent situations are crucial. An emerging literature uses or proposes using data from time/space diaries, smartphones, GPS devices, volunteered geographical information, and social media (e.g., Foursquare) to provide more precise measures of individuals' activity spaces and their locations in space and time (Basta et al. 2010, Browning et al. 2016, Browning & Soller 2014, Matthews & Yang 2013, Wiebe et al. 2016). Although the software and methods of data collection used for analysis have been developing over time, these methods are rarely used to measure ETV.

One exception is the work of Wikström et al. (2012) on children's activity fields, defined as the specific settings that young people occupy within and outside their neighborhoods, and measured through space/time budgets. Another exception is research from the Adolescent Health and Development in Context study, which utilizes data on GPS locations combined with ecological momentary assessment data collection to link children's location with interactions and experiences that they report in real time (Browning & Soller 2014).

These novel forms of data collection come with their own limitations, but there is great potential for newly available administrative data, new technology, and innovative forms of data collection to generate more-refined measures of ETV. These measures will allow researchers to go beyond the measurement of self-reported exposure to violent interactions and to measure exposure to violent environments as well as specific situations—locations and times—where violence is more likely.

THEORY AND EVIDENCE ON THE LONG REACH OF VIOLENCE

The literature on the consequences of ETV began with research on the effects of war and expanded to consider trauma arising from exposure to disasters, abuse and maltreatment, victimization, terrorism, and extreme violence (Garbarino et al. 1992, Glodich 1998, Terr 1990). Much of this initial research focused on the measurement of symptoms and the diagnosis of psychological disorders in the aftermath of major traumatic events, with a particular emphasis on post-traumatic stress disorder (PTSD). Over time, empirical work expanded to focus on the impact of exposure to less extreme forms of violence and to consider a wider range of children's developmental outcomes not limited to psychological symptoms and disorders.

Reviews of this extensive literature describe dozens of studies using a wide range of samples and documenting mostly consistent findings: ETV and violent victimization are associated with psychological symptoms related to stress and trauma and with negative outcomes related to physical and mental health, problem behaviors, academic performance and educational attainment, and cognitive development (Buka et al. 2001; Foster & Brooks-Gunn 2009; Jenkins & Bell 1997; Macmillan 2001; Margolin & Gordis 2000, 2004; Osofsky 1999).

Developmental psychologists have conceptualized ETV as a part of the stress process, situating violence as one of many potential environmental stressors that are associated with characteristics of the individual, family, and neighborhood environment and that affect children's physical and mental health, facilitate shifts in developmental roles, and influence academic and cognitive progress (Foster & Brooks-Gunn 2009). Substantial progress has been made in generating descriptive or correlational evidence on the role of individual, family, and neighborhoods in moderating the impact of ETV (Buka et al. 2001, Foster & Brooks-Gunn 2009), and in generating theory and preliminary evidence on the physiological and social mechanisms by which direct ETV impairs cognitive development and academic achievement (Margolin & Gordis 2000, Massey 2004, Perry 1997).

Despite these advances, the extensive theoretical and empirical literatures on the impact of ETV have not devoted sufficient attention to two fundamental questions: Why do some individuals and families end up in violent environments and others do not, and why do some individuals within violent neighborhoods end up in violent situations and others do not? In other words, the literature on ETV has not adequately considered theoretical and empirical implications of selection into and out of violent environments and situations.

Selection Into and Out of Violent Environments and Situations

Two forms of selection are salient in the study of ETV. The first is selection into and out of violent residential (and school) environments. Surveys of individuals who have volunteered for housing mobility programs show that caregivers' concerns about violence, drugs, and gangs are consistently found to be the primary reasons why low-income families choose to take part in residential mobility programs designed to offer families the chance to move out of public housing located in areas of concentrated poverty (Wilson & Mast 2014). These findings reinforce a point that emerges repeatedly in a large body of ethnographic research: Violence is central to decisions about the selection of residential and school settings (Darrah & DeLuca 2014, de Souza Briggs et al. 2008, Rhodes & DeLuca 2014, Rosen 2017).

Low-income parents who face constrained options in the housing market must take into account affordability, housing and neighborhood quality, neighborhood violence, and their own capacity to mitigate the possibility of violence as they make tradeoffs in deciding where to live (Darrah & DeLuca 2014). Concerns about violence and children's safety often outweigh concerns about school quality among low-income caregivers with school-age children, and incidents of violence are often primary reasons why caregivers decide to leave their block or their neighborhood (Popkin & Cove 2007, Rosen 2017, Rosenblatt & DeLuca 2012). A similar focus on violence is present among the wider population as well, as strong evidence links local crime and violence to patterns of migration into and out of neighborhoods or cities (Cullen & Levitt 1999, Ellen & O'Regan 2010, Morenoff & Sampson 1997). Living within violent environments, whether measured at the blockface, the neighborhood, or the city level, influences mobility decisions in ways that lead to stark differences in exposure to community violence across groups (e.g., see Peterson & Krivo 2010a).

The second form of selection involves the selection into and out of violent situations. Beyond its impact on residential and school decisions, violence forces individuals to actively negotiate the threat of victimization in their everyday lives by altering their routines, their networks, and their parenting styles in an effort to reduce the potential for victimization. To navigate potentially dangerous streets, young people carefully plan their schedules and develop scripts and strategies to allow them to escape situations where violence can emerge (Anderson 2000, Jones 2004).

Within violent environments, parents often monitor their children more closely, keep to themselves, or force their children to isolate themselves within the home from public life (Furstenberg 1993, Jarrett 1999, Rosenblatt & DeLuca 2012). Where violence is seen as inevitable, children may choose to use force strategically or to develop networks that help them ward off potential victimizers in the future (Anderson 2000, Chan Tack & Small 2017, Edin et al. 2015, Harding 2010, Jones 2004).

These examples demonstrate that selection into violent environments and situations is more than a statistical problem; it is also a theoretical problem, a puzzle that is crucial to understanding variation in experiences with violence even among individuals who live within the same or similar environments. ETV is typically measured and analyzed as if it is imposed on passive individuals, and yet individuals within similar neighborhoods have vastly different levels of involvement with

violence or exposure to incidents of violence (Browning et al. 2016, Papachristos et al. 2015). To understand the myriad ways in which local violence affects the lives of children, a first-order task is to develop a more sophisticated understanding of selection into and out of environments and situations where violence is more or less common (Browning et al. 2016, Sampson & Lauritsen 1994, Sampson et al. 2005, Sampson & Sharkey 2008, Sharkey 2006, Wikström et al. 2012, Zimmerman & Messner 2013).

The advances that have been made in the measurement of activity fields and activity spaces are a promising development in the effort to generate theory and evidence on how life within violent environments translates, for some, into exposure to violent interactions. In particular, Wikström has put forth a complex theoretical model to explain individual decisions to resort to violence, or, more generally, to break rules, as a function of the action alternatives available to them within a given social setting and their own propensity to engage in violence (Wikström & Treiber 2009, Wikström et al. 2012). Along with collaborators, he developed the Peterborough Adolescent and Young Adult Development Study (PADS+) to test the core propositions of his theory using novel methods to measure the situations, using locations and times, where violence is most likely to occur (Wikström et al. 2012).

There are few similar examples of research that links theory with data collection designed to test theoretical models of selection into violent environments or situations. I argue that research on ETV must go beyond the analysis of risk factors or correlates of ETV and instead move toward a more-refined theoretical model of selection into violent environments and situations. In other words, I argue for an agenda focused on ETV not only as a causal treatment but also as an outcome of study.

Identifying the Impact of Exposure to Violent Environments

The theoretical problem of selection into violent settings and situations becomes a methodological problem when researchers attempt to estimate the impact of ETV on individual outcomes. The consistent, strong results in the quantitative literature showing that children who witness violence tend to do worse in school, have delays in the development of cognitive skills, exhibit more behavioral and mental health problems, and become involved in violent or delinquent activity at higher rates have led many to conclude that the impact of community violence is causal. But there are two major reasons why this conclusion should not be taken for granted.

First, as noted above, very little research has been carried out to understand or to address nonrandom selection into violent settings (schools, neighborhoods, blocks, locations, or peer groups). Ethnographic research shows that families very consciously select communities, streets, and schools based on the perceived degree of threat posed to children, and characteristics of children and their environments lead some to select into situations and peer groups that have higher risk of violence, whereas others find ways to avoid or minimize the possibility of violence (Sharkey 2006). The problem of selection bias thus looms large for studies that attempt to identify the impact of community violence by comparing children who live in more- or less-violent neighborhoods or who attend more- or less-violent schools.

Second, children who report violent victimization or are exposed to high levels of violence at home, in the community, or in school often are subject to multiple forms of severe disadvantage, maltreatment, and violence in their lives (Finkelhor et al. 2011). In a survey of high-school students focusing on ETV, Jenkins & Bell (1997) found that a high-risk sample of students in Chicago experienced, on average, 3–4 major stressors in the year prior to the interview, including parental job loss, family illness/death, and legal challenges. This pattern may mean that the impact of ETV interacts or combines with exposure to other stressors in the home or community, but

it also makes it very difficult to distinguish the unique effect of ETV that is distinct from the broader effects of disadvantage and environmental stress. As an example, Aizer (2007) found that the effects of different measures of ETV are attenuated or reduced to nonsignificance when more extensive controls are added to regression models or when school- or neighborhood-fixed effects specifications are estimated.

Instead of relying on variation in ETV among individuals or groups who live in different settings, a set of recent studies relies on variation in the timing of violence among individuals or groups who live in the same setting. One set of studies exploits the timing of discrete shocks in violence, or incidents of violence, and another exploits variation in the timing of violence using fixed effects.

Perhaps the most influential study estimating the impact of a discrete act of violence was conducted by Robert Pynoos and several collaborators and focused on a sniper attack at an elementary school (Pynoos et al. 1987, Nader et al. 1990). Nader et al. (1990) reported on assessments with 100 elementary school children 14 months after the attack, which took place on the school playground and resulted in one child's death and injuries to many other children and one staff member. The number of children exposed to the attack on the playground was very small ($n = 19$), but the pattern of reactions is revealing nonetheless. From one month to 14 months after the shootings, children who were on the playground when the attack took place exhibited more extensive symptoms of PTSD than children who were inside the school. For children inside the school when the attack occurred, symptoms of PTSD faded in the 14 months following the incident. For those on the playground, symptoms persisted over time. A majority of those on the playground continued to report fear of a recurrence, sleep disturbance, and jumpiness more than a year after the attack.

In recent years, several studies have used similar research designs that exploit exogenous variation in the timing and location of violence to identify causal impacts. Beland & Kim (2016) analyzed the impact of fatal school shootings, including suicides and homicides, on school and student outcomes using a difference-in-differences approach with other schools in the same district serving as the control group. They found that student performance on English and math assessments declined in the aftermath of fatal school shootings, and the impact was driven by homicides rather than suicides. A supplementary student-level analysis demonstrated that the impact on academic performance was not driven by changes in school composition but rather by declines in individual student performance over time.

The effects of violence on academic performance are not limited to incidents that occur on school grounds. Gershenson & Tekin (2015) studied the impact of the Beltway sniper shootings that took place in Washington, DC, and its surrounding suburbs in the fall of 2002. Beginning October 2 and lasting almost three weeks, the random shootings resulted in ten deaths, three additional shooting victims, and an entire region of the country paralyzed by fear.

The researchers analyzed changes in the test scores of students in Virginia schools located within five miles of a sniper shooting and compared them to changes in the scores of students from schools that looked similar but were farther removed from the shootings. Compared to students who went to school farther away from the sites of the shootings, students attending schools within five miles of a shooting were somewhere between five and nine percentage points less likely to pass their state English and language arts or math assessments. The impact of proximity to the sniper shootings was much more intense for students in more disadvantaged schools, with higher rates of low-income students and students from racial and ethnic minority groups.

Sharkey (2010) used data from the Project on Human Development in Chicago Neighborhoods, a large-scale project focusing on child development within the neighborhoods of Chicago, to identify the effects of local homicides on children's performance on cognitive assessments administered as part of the study. Children within the same neighborhoods (block groups, census

tracts, and neighborhood clusters) were interviewed on a rolling basis, allowing for a design that compared children within the same neighborhood who were assessed at different points of time before or following incidents of local violence. Sharkey found that exposure to a homicide close to a child's home within the four days prior to the assessment led to a reduction in African-American children's performance of up to 0.4 standard deviations relative to other African-American children who lived in the same neighborhood but were assessed at a time when no recent violence had taken place. The estimated impact became smaller in magnitude as the length of time between the homicide and the assessment widened and as the distance between the homicide and the child's home increased.

Follow-up studies using a different sample in Chicago and a sample of public school students in New York City replicated the main findings and showed that children are less able to control their impulses and maintain attention during testing in the aftermath of violence (Sharkey et al. 2012, 2014). Impacts on effortful control and executive function thus appear to be one important mechanism explaining children's reductions in cognitive performance after incidents of violence.

Three separate studies have used child-, family-, or neighborhood-fixed effects to estimate how changes in exposure to community violence are associated with child behavior or performance in school. Lacoe (2016) drew on a data set that tracks public school students in New York City over successive academic years and utilized both student- and classroom-fixed effects to identify how feelings of safety in school are linked with academic achievement. In student-fixed effects models, Lacoe found that in years when students reported feeling unsafe in school their performance on standardized achievement tests declined. Similarly, Burdick-Will (2013) analyzed data from public schools in Chicago using school- and neighborhood-fixed effects specifications and showed that in years when children were exposed to higher levels of violence they performed worse on standardized achievement tests in reading and math, whereas grades were not affected.

Aizer (2007) drew on a sample of children in Los Angeles County neighborhoods and used family- and neighborhood-fixed effects models to estimate the relationship between neighborhood violence and personal victimization and several measures of child cognitive skills and behavioral problems. Specifications that did not include fixed effects showed strong effects of ETV and victimization on developmental outcomes, but those effects were attenuated in models with fixed effects. In neighborhood-fixed effects specifications, however, being robbed in the past year continued to have negative effects on academic achievement scores. In family-fixed effect specifications, all three measures of exposure to community violence—having a friend in a gang, being robbed, or neighborhood hospitalizations for assault—were associated with internalizing behavior problems, and knowing a gang member was associated with reductions in achievement scores.

Two international studies extend this work by demonstrating how outbreaks of gang violence can reverberate across communities or entire cities, disrupting the daily activities of a diverse group of residents, including both students and teachers. Caudillo & Torche (2014) used school-, municipality-, and state-fixed effects specifications to identify the effect of fluctuations in homicide within municipalities of Mexico on primary grade school failure. Although the magnitude of their estimates varied, all specifications showed that higher rates of local homicide increase the rate of primary grade school failure.[5]

Monteiro & Rocha (2017) focused on periods of intense violence in the favelas of Rio de Janeiro arising from territorial battles fought among drug gangs. Analyzing data from fifth graders' test scores spanning from 2003 to 2009, they found that performance on math exams declined

[5] Márquez-Padilla et al. (2015) also study violence in Mexico and find no effects of local violence on school enrollment.

in academic years when battles between drug gangs broke out. The impact of gang conflicts was greater if schools were closer in proximity to the location of violence and if the spike in violence occurred in the months preceding exams. The authors also provided suggestive evidence on mechanisms, documenting that teacher absences, school shutdowns, and principal turnover all increased in years when local violence rose due to gang battles.

EXPOSURE TO VIOLENT ENVIRONMENTS, SITUATIONS, AND INTERACTIONS

ETV is typically studied at the level of individuals and limited to the act of witnessing or experiencing an incident of violence directly. The central argument of this review is that this approach does not capture the full consequences of violence, and it typically does not generate convincing causal evidence on its impact.

To capture the long reach of violence, I have argued for a broader conceptualization that focuses not only on exposure to violent interactions but also on exposure to violent residential environments and violent situations. This reconceptualization is supported by decades of ethnographic research and reinforced by recent quantitative research demonstrating, first, that violence can affect everyone within entire communities, altering everyday decisions, routines, and networks, and disrupting individual functioning and behavior and, second, that individuals within the same communities have vastly different experiences with actual incidents of violence.

The proposed reconceptualization of ETV begins with data and measurement. Although most reviews of the literature on ETV focus primary attention on quantitative studies, many of which rely on unconvincing methods, the contributions of ethnography are often ignored or given minimal attention. Perhaps the most powerful evidence on the impact of violence has come from ethnographic research in violent communities, and ethnographic data will continue to be central to refining scholarly understanding of the full impact of ETV.

New methods of data collection using administrative data, time/space diaries, smartphones, GPS devices, social media, and other sources have the capacity to enhance the literature on exposure to violent situations and violent environments in multiple ways. First, data collection designed to capture individuals' locations in space and time allows for more precise measurement of exposure to violent interactions and violent situations that does not rely on self-reports. Second, the expanded accessibility of administrative data allows for continuous measurement of violence in children's environments that may or may not be witnessed directly but still may affect children's daily lives.

The reconceptualization of ETV also requires advances in theory and the development of more creative, rigorous research designs and methods. Violence becomes salient in families' lives well before they witness an incident in person, and yet the impact of violence on residential decisions, school choices, daily activities, and network formation has received minimal attention in the literature. Development of stronger theory on selection into and out of violent environments is required to move toward a more complete account of the subtle ways in which individuals respond to the threat of violence that they do not see firsthand.

Advances in theory on selection go hand in hand with advances in analytical methods designed to overcome the bias that arises in quantitative work that does not account for nonrandom selection of homes, schools, and locations within communities. The set of recent studies exploiting exogenous variation in the timing of local violence offers a promising approach to identifying the impact of specific incidents or waves of violence, but other approaches that exploit variation in violence arising from other plausibly exogenous shocks like the timing of social policies, shifts in policing, or weather patterns are necessary to continue to develop new evidence on the long reach of violence.

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