



Community violence and young children: making space for hope



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Community violence, toxic stress and developing brains

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How does growing up in a violent community affect young children's developing brains? While this specific question is not yet well researched, an increasing amount is known about the neurological impact of 'toxic stress' more generally. The following is a summary of a longer article by Professors Nathan A. Fox and Jack P. Shonkoff, published in issue 116 of *Early Childhood Matters* (2011).

All children experience fears during childhood, including fear of the dark, monsters and strangers. These fears are normal and temporary. However, chronic activation of the body's stress response systems – as may occur, for example, when living in a violent community – has been shown to disrupt the efficiency of brain circuitry and lead to both immediate and long-term problems in learning, behaviour, and both physical and mental health. This is especially true when stress system overload occurs during sensitive periods of early brain development.

When children repeatedly experience fear, fear can become generalised. Raised levels of the stress hormone cortisol strengthen the formation of memories of fearful events, while impairing memory formation in non-threatening contexts. This can lead children to lose the capacity to differentiate between threat and safety – for example, interpreting an ambiguous facial expression as anger – with implications for their ability to form healthy relationships. Generalised fear is thought to underlie the development of anxiety disorders, such as post-traumatic stress disorder.

Heightened stress has been shown in animals to impair the development of the prefrontal cortex, the brain region that, in humans, is critical for the emergence of executive functions – a cluster of abilities such as making, following and altering plans; controlling and focusing attention; inhibiting impulsive behaviours; and developing the ability to remember and incorporate new information in decision making. Evidence shows that prolonged exposure to fear can impair early learning and adversely affect later performance in school, the workplace and the community.

Research tells us that fears are not just passively forgotten over time, they must be actively 'unlearned'. However, while the amygdala and hippocampus are the main areas of the brain involved in fear learning, the prefrontal cortex is much more important in fear unlearning. Not only does the prefrontal cortex mature later in life, its development – as we have seen – can be impaired by prolonged exposure to stress. Consequently, the effects of toxic stress in early childhood can be long-lasting and hard to recover from.

Reference

Fox, N.A. and Shonkoff, J.P. (2011). How persistent fear and anxiety can affect young children's learning, behaviour and health. *Early Childhood Matters* 116: 8–14. Available at: <http://www.bernardvanleer.org/Hidden-violence-Protecting-young-children-at-home> (accessed October 2012)

Note

¹ For updates on the Center on the Developing Child's latest research on toxic stress, visit http://developingchild.harvard.edu/topics/science_of_early_childhood/toxic_stress_response/

The impact of public violence on children: the current state of research

What does current academic research tell us about the impacts of public violence on young children? This article briefly summarises two pieces in the *Encyclopedia on Early Childhood Development*: ‘The effects of community violence on child development’ by Nancy G. Guerra and Carly Dierkhising (2011), and ‘Effects of physical family and community violence on child development’ by Holly Foster and Jeanne Brooks-Gunn (2011).

Much remains to be discovered about the impacts of experiencing violence in the community on children’s development. For example, there has been relatively little research on the impact on preschoolers compared to older children. Most studies look at samples of children who are disadvantaged in multiple ways, and do not attempt to disentangle the effects of exposure to community violence from those of other stressors and risk factors. More longitudinal studies are needed to isolate the influence of violence exposure over time.

The majority of research on community violence has been conducted in the USA (Pinheiro, 2006). This research suggests that around 25% of children have been exposed to community violence (Finkelhor *et al.*, 2010). Among the few international studies that exist, research among 8–13 year olds in Cape Town, South Africa, found that 40% had witnessed someone being killed in their neighbourhood (Shields *et al.*, 2009). Few studies have attempted to isolate the effects of hearing about violence, witnessing violence or being a victim of violence, instead bundling these into the cover-all term of ‘exposure’ to violence.

Research does, however, clearly show that children exposed to violence are at greater risk of various developmental problems. It is well established that children who are raised in a violent environment are

more likely to behave violently in turn, displaying behaviour including aggression, delinquency, violent crime and child abuse (Dodge *et al.*, 1990). Children exposed to violence have higher rates of mental health problems during childhood and adolescence, including depression, anxiety and post-traumatic stress disorder (Sheidow *et al.*, 2001). Recent research also finds consistent links between exposure to community violence and asthma in children (Wright *et al.*, 2004; Sternthal *et al.*, 2010), including wheezing among preschoolers (Berz *et al.*, 2007).

A recent meta-analysis found that the effect most strongly predicted by exposure to community violence was post-traumatic stress disorder (Fowler *et al.*, 2009). The greater the exposure to violence, the more serious the symptoms (McCart *et al.*, 2007). In adolescence, these symptoms may include depression and withdrawal (more common among girls), or hypersensitivity to perceived threat (more common among boys) (Attar *et al.*, 1994).

Pathways and potential solutions

Through what pathways does community violence affect young children? Studies point to the importance of maternal distress, as preschool children are likely to experience community violence in their mother’s company (Linares *et al.*, 2001). For example, in one US study of children aged 3–5, community violence was found to increase maternal distress, which in turn was found to lead to children being more hesitant with their peers and interacting less positively with others (Farver *et al.*, 1999).

When very young children are exposed repeatedly to community violence, they can find it hard to form trusting relationships (Osofsky, 1995). This neurobiological reaction is adaptive in that lack of trust is likely to be conducive to a child’s survival in violent settings. However, research shows that its effects on brain development are so profound that they persist even when the environment is no longer violent and the lack of trust is no longer adaptive (Perry, 1997). The lasting effects of lack of trust include interfering with children’s development of a secure sense of self and confidence

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For some children, exposure to community violence creates a constant state of fear. Photo • Jon Spaull/Bernard van Leer Foundation

to explore their environment, and can compromise relationships well into adulthood.

For some children, exposure to community violence creates a constant state of fear. While the stress response apparatus in the central nervous system is adaptive in one-off 'fight or flight' situations, heightened stress hormones for extended periods can lead to such problems as being likely to perceive threats when none is actually there, and to respond either by withdrawing emotionally or by lashing out with unnecessary violence (Pynoos, 1990; Margolin and Gordis, 2000).

How can the effects of children's exposure to violence be minimised? Social support has consistently been found to buffer the effects of violence on children's problem outcomes (Proctor, 2006; Foster and Brooks-

Gunn, 2009). Boys from cohesive families have also been found to be less likely to respond to community violence by themselves perpetrating violence. Further work is needed, however, to better understand these potential buffering influences of school, community, family and individual resources.

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Note

- 1 The *Encyclopedia on Early Development* is available online at: <http://www.child-encyclopedia.com> (accessed September 2012).

The effects of community violence on children's cognitive performance and self-regulation

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Research in Chicago shows that children who are exposed to a recent homicide in their community perform worse on assessments of cognitive skills and display impaired attention and impulse control when compared with other children living in the same communities but assessed at different times. Given the prevalence of homicides in Chicago's most violent neighbourhoods, the consequences for children's ability to learn and perform well in the classroom are potentially severe.

How can we measure the effect that community violence has on children? We can't simply compare children who live in violent communities with those who live in non-violent ones, because families do not randomly select into violent and non-violent environments. For a wide variety of reasons, some families are more likely than others to live in violent communities. That means we couldn't be sure whether any differences we found among children were being caused by community violence, or by those other factors that lead families to live in violent communities.

In a set of recent studies I have developed a different approach to identifying the effect of community violence by looking at children in the same community, but at different points in time. This research involves merging together data from different sources: data that have been collected from young people in Chicago neighbourhoods and data on the location and timing of incidents of violent crime in the city. From the first source of data it is possible to analyse the performance of children on a set of assessments designed to measure cognitive skills and self-regulatory behaviour, and to identify where children live and when they were assessed. From the second source it is possible to see where and when incidents of extreme violence, like homicides, occurred. Merging these sources of data by location and timing, it is possible to assess whether recent local homicides had any effect on children's scores from the various assessments.

In the first article, published in the *Proceedings of the National Academy of Sciences* in 2010 (Sharkey, 2010), I used

data from a survey of children and families in Chicago conducted between 1994 and 2002, the Project on Human Development in Chicago Neighborhoods (PHDCN)¹. The assessments measured children's vocabulary and reading skills, and have been shown by other research to capture dimensions of cognitive skills that are strongly predictive of later educational attainment, labour market success, health, and criminal behaviour.

The interviews for the PHDCN were conducted over a period that spanned several months, creating a natural experiment – some of those children were assessed when there had recently been a homicide in the neighbourhood, while other children in the same neighbourhood were assessed when there had been no recent violence. This enabled me to ask if children performed less well on cognitive performance tests when there had been a recent local homicide. I found that they did. If African American children were assessed at a time when there had been a homicide in the neighbourhood within the previous week, their scores on tests of cognitive skills were substantially lower than other African American children in the same neighbourhood who were assessed at a different time.

What the research tells us – and what it doesn't

It's important to stress some of the things this research doesn't tell us. It doesn't shed light on the mechanisms through which community violence translates into children's lower levels of cognitive performance. There is a large literature demonstrating that children exposed to violence show elevated rates of symptoms related to acute or post-traumatic stress disorder, including disrupted sleep, anxiety, reduced awareness, and difficulty with concentration. All of these are potential mechanisms that might explain the impaired performance on assessments of cognitive skills, but the data are not equipped to test for any of these mechanisms.

The research also doesn't tell us anything about permanent impacts on cognitive development. Still, simply by looking at the number of homicides in the city's most violent neighbourhoods, it is possible to make



Drawing by a child from Favela Santa Maria, Rio de Janeiro, Brazil, as part of a research that revealed that children still had intense memories of the public violence they had witnessed. Photo • Courtesy CECIP

some inferences. If we simplify the study's findings somewhat and assume that a homicide within a child's census tract impairs cognitive functioning for roughly one week, this means that children in the city's most violent neighbourhoods spend about one-quarter of the year functioning at a lower level in their home and school environments, due purely to the stress arising from local violence. If the effects of local violence compromise students' ability to learn, to maintain attention, and to perform well in the classroom, the long-term consequences for children's educational trajectories may be severe.

Finally, the research leaves open an unresolved question – these effects were observed in African American children, but not in Hispanic children. (Children from other racial groups were not exposed to local violence in sufficient numbers to be included in the analysis.) One possible explanation is that the victims of homicides are disproportionately African American, and the homicides may thus feel less salient or less threatening in the lives of Hispanics. However, the data are not sufficiently detailed to test this hypothesis, which would require additional research.

What the research does reveal very clearly is that local violence weighs on the minds of children. It suggests that we shouldn't merely design interventions to provide treatment or counselling for children directly exposed to violence – rather, we should recognise more broadly the impact that violence can have on children throughout the community, regardless of whether or not they witnessed the violence directly or were personally victimised by it.

Effects on preschoolers' self-regulation

A second study, shortly to be published with several collaborators in the *American Journal of Public Health* (Sharkey *et al.*, 2012, in press), used data from interview assessments conducted as part of the Chicago School Readiness Project (CSRPP), a randomised controlled trial of Chicago preschoolers in Head Start programmes from 2004 to 2006. Data from the CSRPP, an intervention conducted by developmental psychologist Cybele Raver, included measures of children's self-regulation, such as attention and impulse control, as well as pre-academic skills such as vocabulary and early math skills.

'Children's exposure to community violence may result in consequences that have the potential to alter educational trajectories and a range of subsequent health and social outcomes.'

Using a similar design to that of the initial study, we found that local homicides within the past week had strong effects on students' attention and impulse control. These effects were stronger the closer the homicide had occurred to where the children lived, with effects approximately doubling for homicides within 1000 feet (300 m) of the home compared to 2500 feet (750 m). Looking at pre-academic cognitive skills, we also found statistically significant effects for homicides occurring within 1500 feet (450 m) of the child's home.

The data available from the CSRPP allowed for additional analysis of the effects of local homicides on parents' self-reported mental health, which appeared quite strong. This finding provides a hint that parents' psychological distress could be one mechanism through which exposure to community violence affects young children's behavioural and cognitive outcomes.

In summary, our research to date supports the idea that exposure to community violence may significantly compromise poor children's cognitive functioning and self-regulatory behaviour, with consequences that have the potential to alter educational trajectories and a range of subsequent health and social outcomes. The next empirical step will be to better understand and test the multiple direct and indirect potential pathways of influence linking exposure to local violence and early learning.

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Note

- 1 For more information on this project, visit: <http://www.icpsr.umich.edu/PHDCN>

