Violent Conflicts and Child Development:

Evidence from Colombia

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September 2013

Abstract

This study examines the effect of exposure to violent conflicts in-utero and in childhood on child's physical, cognitive, and socio-emotional development. The study exploits the exogenous variation in Colombia's armed conflict across municipalities and months as a natural experiment, and measures violence using massacre shocks. Results indicate that exposure to massacres during pregnancy reduces birth weight, and both prenatal and post-natal exposures to violence reduce a child's height-for-age, cognitive test-scores, and worsens socio-emotional behavior. I further examine potential pathways of transmission, at the household level, by which violence may affect children. The findings show that violence reduces household economic resources and negatively affects the home environment (parenting), providing evidence that stress is an important mechanism. The paper carefully examines potential sources of selection bias due to violence such as geographic sorting, migration, fertility, and survival.

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Extended Abstract

Introduction

Violent conflicts have dramatic impacts on societies and they are often considered as one of the main obstacles for economic, social, and political progress in the world today. Households living in war-affected areas face huge costs both in terms of human suffering and socio-economic well-being. While some of these costs can be directly quantified in economic terms, others are not easily measured, for example, welfare-loss, declines in social capital, and forgone investments. Pregnant women and young children represent a particularly vulnerable population to violent conflicts. A growing body of research documents that, conditions experienced in early life matter for an individual's future well-being (Barker, 1992; Cunha & Heckman, 2007; Almond & Currie, 2011). In the early stages --the period that starts in the womb and ends in childhood --, is when a child develops the physical, cognitive, and social skills that will become the foundations for lifelong productivity. To the extent that exposure to violence in early life affects later life outcomes, the results shown in this paper provide more justification for public policies aimed at improving early childhood environment.

Previous studies investigating the effects of early exposure to violent conflicts have shown that violence negatively affects health at birth outcomes (i.e., birth weight) (Camacho, 2008; Mansour & Rees, 2011), child health (i.e., height-for-age) (Valente, 2011; Akresh, Lucchetti, & Thirumurthy, 2012; Miniou & Shemyakina, 2013), and reduces future educational outcomes (i.e., years of schooling) (Chamarbagwala & Moran, 2011; Leon, 2012). Whether violence affects other dimensions of human capital formation (cognitive or socio-emotional) remains largely understudied, and this is an important omission given that, understanding whether such effects exist, is important to quantify the net costs that violent conflicts entail on individuals and on societies.

This paper investigates the causal impacts of early exposure to violence, from in-utero to current age, on young children's physical, cognitive, and socio-emotional development. Child's health is measured using birth weight and height-for-age, a commonly used anthropometric indicator of physical development that is a strong predictor of later life outcomes (Case & Paxson, 2008). Test scores for language development (test visual de imagines, TVIP), verbal ability, mathematical reasoning, and general knowledge about the world (Woodcock-Munoz tests), provide rich information about specific dimensions of cognitive development and school readiness. Objective assessments of three dimensions of child behavior during peer play: play disruption, play disconnection, and play interaction (Penn Interactive Peer Play Scale, PIPPS), offer unique information about a child's social and emotional behavior. Both cognitive and non-cognitive (socio-emotional) outcomes have been shown to be highly correlated with measures of labor market success (Heckman, Stixrud, & Urzua, 2006). Thus, by examining the link between early exposure to violence and outcomes of early human capital formation, this paper provides valuable information regarding potential channels of transmission that may drive long-term effects.

Moreover, this paper examines potential pathways by which violence *may* affect child development. Identifying such mechanisms is relevant from a policy perspective aimed at reducing or mitigating these adversities. Previous research has provided little evidence regarding channels of transmission. The few studies looking at potential pathways have mostly focused on

supply-side mechanisms such as the destruction of infrastructure and social services during wartime, or the displacement of doctors and teachers from conflict-affected areas (Leon, 2012), and others have provided evidence regarding demand-side pathways such as household economic loses during conflict (Minoiu & Shemyakina, 2013). Considering that the focus here is on young children, violence can also exert effects on children through its influence on the home environment and on household resources. This study provides one of the first pieces of evidence on how violent conflicts may affect household economic resources (measured by household income, consumption of food, and parental time use) and parenting quality (measured by the frequency of mother-child routines associated with a child's personal care and active stimulation, and mother-child non-violent disciplines, and physical and psychological aggression).

This study makes several contributions. First, to my knowledge this is the first study to investigate the causal impact of violent conflicts in early life on cognitive and socio-emotional development. Much of what we know on the relationship between violence shocks and child outcomes focusses on child's health (Camacho, 2009; Akresh et al., 2012; Miniou & Shemyakina, 2013), however, the link between violence with other indicators of human capital formation is mostly speculative. Second, this study moves forward from previous studies by providing some evidence on potential pathways of transmission, at the household level, by which violence shocks may affect human capital formation. Third, this paper measures violence using an objective indicator of violence shocks which is the occurrence massacres at the monthly and municipality levels, which has a large exogenous component. In contrast, previous studies (Akresh & de Walque, 2011; Shemyakina, 2011; Ichino & Winter-Ebmer, 2004) have used measures of violence exposure that provide little spatial variation (are usually aggregated at large geographical units) or little or no variation the intensity of violence; and/or use victim self-reports of damages to measure changes in violence, which are subject to the bias associated with non-random self-reports (Leon, 2012). Fourth, due to the unique survey data that provides information on a child's geographic location even prior to a child's birth, violence exposure is correctly identified for each child, which reduces the problem of selective migration. Without this unique advantage of the survey, 12% of children (migrant families) could be assigned an incorrect violence exposure.

Data

This study uses data from Colombia, a country that for more than 50 years has faced an internal armed conflict – one of the longest in the world. The main armed actors, two illegal groups, guerrillas and paramilitary forces, are responsible for terrorizing local populations, killing, raping, displacing entire villages in addition to other human rights violations as well as finance the conflict through drug-trafficking. I use the occurrence of massacres in Colombia in each month and in each municipality to identify violence shocks, claiming that massacres are unexpected terrorist attacks perpetrated by armed actors, which generate a disproportionate amount of fear and stress in the local population. Massacres are exogenous to the household and child and they are uncorrelated to other measures of economic activity at the municipality and monthly levels after accounting for geographic fixed effects (as I show in the paper). The occurrence of these shocks has severely compromised people's well-being in Colombia. From 1983 to 2011, 2,087 massacres were committed in Colombia, in which more than 9,500 people were killed (SEMANA, 2013).

I use several micro-data sources to investigate the effects of violence on human capital. First, I employ Vital Statistics Birth Records for several years (N= 3,905,201) to estimate the effect of violence during each trimester of pregnancy on birth weight and other health at birth outcomes. Second, I use data the 2007 evaluation survey of *Hogares Comunitarios de Bienestar* (HCB), the largest social program in Colombia, to assess the effects of violence on child development. The HCB is a subsidized childcare intervention that currently serves almost 800 thousand children under age 7, from the lowest income percentiles. This survey is exceptional in terms of sample size (20,000 children between 0 to 7 years of age) (the N varies by outcome) and quality of children's outcomes, as it provides rich measures of children's physical, cognitive, and socio-emotional development, as well as household demographic and socioeconomic characteristics, and parenting behaviors. Due to the unique quality of the data, it is possible to identify the exact level of violence to which a child was exposed to while in-utero and in childhood.

Empirical strategy

The identification strategy relies on exploiting the exogenous variation in cohorts exposed to the armed conflict in Colombia and compare children's physical, cognitive, and socio-emotional developmental outcomes of those who were exposed to violence versus those who were not. To identify children exposed to massacre shocks during their early stages of life, in-utero and in childhood, the Vital Statistics and the HCB survey were spatially and temporally merged with data on the occurrence of massacres available at the municipality and monthly levels. The information on massacres was obtained from the rich violence data set compiled by the Center for Economic and Development Studies of Universidad de los Andes- Colombia (CEDE).

I carefully study potential sources of selection bias such as endogenous sorting, migration, fertility, and survival.

Results

Preliminary results show that young children exposed to massacre shocks in early life experience significant developmental setbacks. An increase in 1 standard deviation in early life violence exposure reduces height-for-age by 0.09 of 1 standard deviation (SD). Cognitive outcomes also decline. I find that the PPVT falls by 0.34 of 1 SD, Woodcock Munoz-Verbal ability falls by 0.05; WM-Mathematical reasoning by 0.20, and WM-General knowledge by 0.04 of 1 SD). Socio-emotional development also worsens: PIPPS - isolation increases by 0.16 and PIPPS- adequate interaction falls by 0.21 of 1 SD respectively due to a 1 SD increase in violence. Furthermore, the findings on potential pathways of transmission suggest that high violence is associated with a decline in household economic resources and with lower frequency of active stimulation and personal care routines, and more frequent physical and psychological aggression from the mother to the child.

References

Akresh, R., Luchetti, L. and Thirumurthy, H. (2012) Wars and Child Health: Evidence from the Eritrean-Ethiopian Conflict, *Journal of Development Economics,* v.99, 330-340.

Akresh, R. and de Walque, D. (2011) Armed Conflict and Schooling: Evidence from the 1994 Rwandan Genocide. World Bank, Working paper.

Almond, D. and Currie, J. (2011b) *Handbook of Labor Economics*. Elsevier. Chap. Human Capital Development Before Age 5, v.4b, 1315-1486.

Barker, D.J.P. (1992) Fetal and infant origins of adult disease. *British Medical Journal*.

Camacho, A. (2008) Stress and Birth Weight: Evidence from Terrorist Attacks. *American Economic Review: Papers & Proceedings*, 98:2, 511–515.

Case, A. & Paxson, C. (2008) Stature and Status: Height, Ability, and Labor Market Outcomes. *Journal of Political Economy*, University of Chicago Press, v.116(3), pages 499-532, 06.

Cunha, F. and Heckman, J. (2007) The Technology of Skill Formation. *American Economic Review*, 97(2):31-47.

Heckman, J.J., Stixrud, J., Urzua, S. (2006) The effects of cognitive and non-cognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics* 24 (3), 411–482.

Ichino, Andrea and Winter-Ebmer, R. (2004) The Long-Run Educational Cost of World War II. *Journal of Labor Economics*, 22, 57-86.

Leon, G. (2011) Civil Conflict and Human Capital Accumulation: The Long Term Effects of Political Violence in Peru. *BREAD Working Paper, N. 245*.

Minou, C. and Shemyakina, O. (2012) Armed Conflict, Household Victimization, and Child Health in Côte d'Ivoire. *Working paper*.

SEMANA Magazine, (2013) Colombia.

Shemyakina, O. (2011). The Effect of Armed Conflict on Accumulation of Schooling: Results from Tajikistan. *Journal of Development Economics*, 95(2): 186-200.

Valente, C. (2011) Children of the Revolution: Fetal and Child Health amidst Violent Civil Conflict. *SERPS Working Paper, #*2011018.