

# Cohort at Risk: Long-Term Consequences of Conflict for Child School Achievement\*

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## Abstract

In this paper we investigate the long-term effect of households' exposure to the Israeli-Palestinian conflict during the Second Intifada (2000-2005) on children's primary school achievement in the West Bank. Our identification strategy exploits the exogenous geographical variation in locality-level conflict intensity during the Second Intifada. We show that an increase in family experience of conflict has a large negative long-term effect on the educational attainment of children. Our results also suggest that impaired non-cognitive rather than cognitive skills are likely channels through which the conflict may affect children's educational achievement.

**JEL Classification:** D10, I20, F51, O12

**Keywords:** Conflict, Schooling, Children.

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# 1 Introduction

Violent conflicts can have enormous social and economic consequences for the affected civilian population. These consequences can be especially dramatic for children. A growing body of research from different countries provides robust evidence of the short-run adverse effects of conflicts on a large array of children's outcomes, including, for instance, health (Minoiu & Shemyakina, 2014; Akresh et al., 2012), psychological well-being (Blattman & Annan, 2010), child labor (Di Maio & Nandi, 2013), and education (Shemyakina, 2011; Brück et al., 2014; Di Maio & Nandi, 2013). However, exposure to conflict may also affect outcomes of individuals later in life, particularly if this happens during early childhood which may be a sensitive or even critical period for the development of important skills in life (Conti & Heckman, 2012).

To our knowledge, only few contributions have attempted to investigate the long-run effects of exposure to conflict on children's outcomes such as educational attainment, and the resulting empirical evidence remains rather inconclusive. For example, León (2012) analyzes the effect of the Peruvian civil conflict between 1980 and 1993 on the educational achievement of individuals affected before school-age. Exposure to conflict is measured as the number of years a child lived in a district that experienced violence. Although the effect of exposure to conflict was found to be smaller in the long- than in the short-run, it proved to be persistent, with the average person accumulating 0.3 less years of schooling upon reaching adulthood. Akresh & De Walque (2008) assess the impact of the 1994 genocide in Rwanda on educational achievement several years after the conclusion of the conflict. Comparing cohorts that had already left school at the time of genocide and cohorts that were still enrolled in school, they provide evidence of a decline in schooling attainment of close to one-half year for those exposed to the conflict. On the other hand, Arcand & Wouabe (2009), examining the 27-year-long Angolan civil conflict, report significant differences between the long- and short-run impacts of conflict intensity on a variety of children's outcomes, including school enrollment. Conflict intensity is measured by the number of war-related casualties within a given radius of the community of residence in a given year. In the short-run, conflict intensity worsens child health, does not significantly affect household expenditures, decreases fertility, and *increases* school enrollment. In contrast, in the long-run they find a negative and significant impact of conflict intensity on child health but no impact on household expenditures, fertility, and – most notably for our work – school enrollment.<sup>1</sup>

In this paper, we explore long-term consequences of family exposure to the Israeli-Palestinian conflict on children's school achievement in upper basic school (grades 5 to 9) in the West Bank. Basic education plays a critical role in shaping human capital accumulation and socio-economic

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<sup>1</sup>A related but distinct strand of the (economic) literature has looked into long-run effects of intrauterine exposure to war-related famines, with mixed results (Stein et al., 1972; Neelsen & Stratmann, 2011; Scholte et al., 2015; Jürges, 2013). For instance, both Scholte et al. (2015) and Jürges (2013) find significant long-run effect on adult educational attainment and labor market outcomes among Dutch and German children, respectively, who were exposed to undernutrition in the first trimester of pregnancy. In contrast, Stein et al. (1975) find no effect of exposure to the Dutch famine on intelligence tested in early adulthood. Ichino & Winter-Ebmer (2004) and Akbulut-Yuksel (2014) find negative effects of being of school-age during WWII on completed years of schooling. Kesternich et al. (2014) document negative effects of exposure to hunger, dispossession, and persecution during and after WWII across 13 European countries.

well-being, particularly for the developing regions (Hanushek & Woessmann, 2012). This is also true for the setting of our study (UNESCO, 2011). Specifically, we look at educational attainment seven years after the end of the Second Intifada among children whose families were directly affected by this conflict. The focus on longer-run effects on primary education outcomes sets our paper apart from earlier analyses of short-term effects of the Second Intifada (Al Kafri, 2003; Di Maio & Nandi, 2013; Brück et al., 2014). Another key feature is the use of a direct, self-reported measure of household exposure to a violent event during the conflict (i.e., house searches and occupations by the Israeli army). Last but not least, we provide detailed analyses of the causal channels through which exposure to conflict may affect educational outcomes – which is critical for designing and implementing effective policies that protect children from the negative conflict effects (Justino, 2011). Our approach is novel in the sense that by distinguishing between cognitive skills (IQ) and non-cognitive skills (personality and behavioral problems) as possible causal mechanisms we provide a mirror image of the work by Heckman and coauthors on the long-term beneficial effects of preschool programs, see e.g. Heckman et al. (2013).

The Second Intifada took place between September 2000 and February 2005. During that period, there was a re-surge in the intensity of violence between between Palestinian organizations and Israeli Defense Forces (IDF) that resulted in more than 38,000 casualties (dead and wounded). It claimed the life of about 4,000 Palestinian and 1,000 Israeli civilians (18% of which were children), with the number of fatalities varying markedly across localities and over time.<sup>2</sup> For example, 2002 saw a peak in the number of deaths in the context of a large-scale Israeli military offensive, Operation Defensive Shield, in response to Palestinian suicide attacks. This military operation was concentrated primarily among some very violent localities in the West Bank, such as Jenin, Nablus, and Hebron (Mansour & Rees, 2012). During the conflict, the IDF have engaged in numerous operations involving human rights violations against civilians in Palestine, such as demolitions of Palestinian houses, arrests, beatings and abuse. Tight restrictions were imposed on the movement of people and goods within the Palestinian territories and between the territories and Israel (see, for instance, B'Tselem, 2002; Calì & Miaari, 2013). As noted by Mataria et al. (2009), these mobility restrictions further depressed the Palestinian economy, leading to a rise in unemployment, a decline in real wages, and a reduction in the quantity and quality of food. The initial building of the separation barrier across the West Bank contributed to a further division of Palestinian communities by isolating them from their surroundings (UNSCO, 2014). The social and political consequences of this conflict did not stop with the end of the Second Intifada. On the contrary, they are likely to be profound and persistent (Jaeger et al., 2012). An important aspect of the Second Intifada relevant to researchers is the temporal and spatial variation in the level of violence – which can be fruitfully exploited for the identification of causal effects. This is also made possible by the detail of information on the intensity of the conflict as it is made publicly available by non-governmental organizations such as B'Tselem.<sup>3</sup>

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<sup>2</sup>For a detailed description of the different periods of violence during the Second Intifada see, for instance, Jaeger & Paserman (2008)

<sup>3</sup>B'Tselem is a Israeli human rights organization, which provides information on each Palestinian and Israeli fatality, including the date, location and circumstances of the fatality, and the age, sex and locality of residence of the victim.

As noted above, a key aspect of our analysis is the use of a direct, self-reported measure of household exposure to a violent event during the conflict. Such direct measures of exposure are often missing from conflict data. While they improve our understanding of the consequences of conflict, (retrospective) self-reports have limitations, for instance due to recall bias (Brück et al., 2015). Moreover, an individual family's exposure to the conflict might depend on a range of characteristics that are also linked with children's educational attainment, and is thus likely not exogenous. Therefore, we exploit the locality-level variation in conflict intensity to identify the effect of households' experience of conflict-related events. One earlier example of an analysis that employs the number of fatalities in a given locality to measure conflict intensity during the Second Intifada is Brück et al. (2014). The authors use the year-to-year variation in the number of (Palestinian) victims at the school locality to investigate the short-term effects of violence on students' probability to pass the high-school final exam. We follow Brück et al. (2014) in using the locality-level number of fatalities as a measure of conflict intensity, but since we look at long-run effects of the conflict, we employ the *cumulative* number of victims over the entire Second Intifada period. Our identification relies on the assumption that the number of fatalities in the household locality only influences child primary education outcomes through family exposure to conflict. This assumption may not hold if there exist time-invariant unobservable factors at the locality level correlated with both conflict intensity and children's primary education performance. To circumvent this problem, we control for a range of local labor market and institutional characteristics, such as unemployment rate, poverty rate, the proportion of the locality under the Israeli administration as well as the presence of the separation wall.

A further threat to the validity of our exclusion restriction arises from the endogenous sorting of households across localities in response to increased levels of violence. In particular, if households systematically move away, and children's primary education outcomes are correlated with the household decision to move, this can lead to biased estimates of family exposure to conflict. While we cannot address this concern directly, we note that in the West Bank during the Second Intifada, internal and external mobility has been extremely difficult and is still at a very low level. For example, Mansour & Rees (2012) point out that most Palestinian families living in the West Bank could not migrate because of the harsh mobility restrictions imposed by Israel. Furthermore, data from the most recent (2007) census suggest that less than 10% of the current West Bank residents have moved away from their mother's place of residence at birth (PCBS, 2010).

For our empirical analysis, we draw on data we collected in 2013 in the West Bank, which contains information on a random sample of primary-school students in grades 5 to 9 and their families. These data are well suited for our purposes. First, they contain administrative information on children's primary school grades for three subsequent school years, i.e., 2010/2011, 2011/2012 and 2012/2013. Second, they contain retrospective self-reported information on parents' experience of violence during the Second Intifada. Finally, the data contain detailed information on children,

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The B'Tselem data has been employed by many authors analyzing the Israeli-Palestinian conflict (see, for example, Jaeger et al. (2012) or Mansour & Rees (2012)). These data are considered as being accurate and reliable by both Israelis and Palestinians.

including measures of cognitive and non-cognitive skills, thereby enabling us to shed light on the potential mechanisms through which family's exposure to conflict may affect children's school achievement. Throughout the analysis, we combine the individual level data with locality-level information on the number of fatalities from the beginning of the Second Intifada in September 2000 to February 2005, allowing us to exploit the previously discussed geographical variation in fatalities.

Overall, our results demonstrate that family exposure to conflict during the Second Intifada has long-term effects on their children's primary education achievement in the West Bank. An additional event of household exposure to conflict reduces their children's grade point average (GPA) by 5.74 points (on a 0 to 100 scale), which corresponds to a decline of approximately 0.3 standard deviations. As regards potential mechanisms through which the parents' exposure to conflict may affect children's performance in primary school, we show that more exposure to conflict leads to lower non-cognitive skills, such as conduct problems or a reduced level of conscientiousness. In contrast, cognitive skills, although being important determinants of school achievement, appear not to be affected by family exposure to conflict.

The contribution of our paper to the extant literature is threefold. First, to the best of our knowledge, we are the first to focus on the long-term effects on children's primary school achievement of increased household exposure to political violence during the Second Intifada. This crucially differentiates our work from previous studies that estimate the short-term impact of the Second Intifada on the human capital accumulation of students in the West Bank (Al Kafri, 2003; Brück et al., 2014; Di Maio & Nandi, 2013). Second, the richness of our dataset allows us to provide direct evidence on the potential mechanism underlying the relationship between family exposure to conflict and their children's primary education outcomes, considering, in particular, measures for children's cognitive and non-cognitive skills. Notably, we are not aware of any papers that have looked at skill development itself as a potential mechanism. Finally, by looking at how exposure to conflict in the early stages of a child's development affects her outcomes later on in life, this paper contributes also to the debate on whether the early childhood environment has long-term consequences (see, for instance, Currie (2001); Heckman (2000); Krueger & Whitmore (2001); Gould et al. (2011)).

The remainder of this paper is organized as follows. Section 2 presents a description of the data. Section 3 describes the empirical specification and identification strategy. Section 4 shows our main results and robustness checks. Section 5 discusses the potential causal channels. The last Section summarizes our findings and concludes.

## **2 Data**

The data used in this paper are drawn from a new dataset collected in 2013 in the West Bank and East Jerusalem in the context of a joint research project between Wuppertal University, Hebrew University and Al-Quds University funded by the German Research Foundation (DFG). The dataset contains information on a sample of approximately 6,000 primary school students (around

4,000 girls and 2,000 boys – girls were oversampled) in grades 5 to 9 and their families. Students were randomly selected, stratified by grade level, from a random sample of 100 single-sex primary schools across the West Bank, stratified by region (North, Center and South) and school authority (public or UNRWA schools).<sup>4</sup>

The dataset combines administrative and survey data. First, it contains individual grades in each subject for three subsequent school years, i.e., 2010/11, 2011/12, and 2012/13. This information was obtained from the Ministry of Education’s administrative records. We use this information to create our main educational outcome in primary school: student GPA, which is computed as the average of the most recent grades (i.e., school year 2012/2013) obtained in the six main subjects: Arabic, English, Science, Mathematics, Social Science and National Education, and Religious Education. This set of subjects covers more than 80% of the weekly lessons (UNESCO, 2011). Students are graded on a scale ranging from 0 to 100.

Second, our dataset provides information at the individual and household level collected through paper-and-pencil student and family questionnaires. Of particular importance for our study is the parent-reported information on whether households themselves were exposed to violent events during the Second Intifada. This information is used to create the main explanatory variable in our analysis. The following question was asked of each household respondent: “During the Second Intifada, has your household experienced any of the following events?”. The list of possible answers comprises seven items and reflects two aspects of the exposure to conflict: violence and economic consequences. For the purpose of this paper, we focus on the following violent events: “House was searched”; “House was occupied while you were in it”; “House was occupied and you were forced out”; “House was sealed or destroyed”. Whereas one quarter of households reported that the house was searched, between 5% and 8% reported any of the other events. Furthermore, households are also asked about the year and month of the event. Among the households who reported exposure to conflict, 40% did not provide an answer regarding the date. The answers of those who gave a date are summarized in Figure B.1 in the Appendix. A small number of households reported events that happened during the First Intifada, some more reported events that happened after the end of the Second Intifada. These events were excluded from the analysis. Inspection of the reported dates further indicates that the events often took place in the same month and year, suggesting that answers to our exposure questions refer to the same episode. Apparently, there is no single “correct” way to use the self-reported information on exposure to conflict in our setting. For ease of interpretation, we use the raw count of events reported during the Second Intifada (a score ranging from zero to four). In a robustness analysis, we consider alternative definitions of exposure to conflict, and demonstrate that our results are not sensitive to these changes.

Third, our data contain information on children’s cognitive and non-cognitive skills, which we use to study the mechanisms by which household exposure to conflict affects educational attainment. Cognitive ability is measured by three major cognitive tests (verbal, numerical, and figural),

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<sup>4</sup>UNRWA schools are run by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). They provide basic education to children of Palestinian refugees until grade 9. All types of school are required to follow the same national curriculum.

each consisting of subtests covering a wide range of item content (e.g., analogies, series, sentence completion, vocabulary). The subtests were selected and adapted from established tests of general ability: the Cognitive Ability Test (Thorndike & Hagen, 1971), Milta – a Hebrew version of the Large Thorndike Test (Ortar & Shachor, 1980), Standard Progressive Matrices (Raven, 1983), and the Culture Fair Intelligence Test (Cattell & Cattell, 1965).

Our indicators of non-cognitive skills are often used measures of mental health and personality traits. We assess student mental health using the Strengths and Difficulties Questionnaire (SDQ), a 25-item behavioral screening questionnaire designed to measure mental health problems in children and adolescents between 3 and 16 years old (Goodman, 1997; Goodman et al., 2000).<sup>5</sup> SDQ items are used to construct three indicators of children’s mental health: the total difficulties scale, and the corresponding sub-scales for “internalizing” symptoms (emotional symptoms and peer problems) and “externalizing” behavior problems (conduct problems and hyperactivity/inattention). “Internalizing” symptoms are linked to anxiety and depression, whereas “externalizing” behavior problems are related to deviant and aggressive behaviors. Items for these two subscales are listed in Table A.1 in the Appendix . To facilitate interpretation, we standardize scores for internalizing and externalizing problems to have mean zero and standard deviation one.

Student personality is measured in terms of the Big Five model, a widely accepted approach for conceptualizing personality (Barenbaum & Winter, 2008; Goldberg, 1993), which is increasingly used also in labor market research to assess “soft” skills (Heckman & Kautz, 2012). According to this model, personality traits can be organized in five basic dimensions: openness, conscientiousness, extraversion, agreeableness, and neuroticism. We use a parent-reported 15-item version of the Big Five questionnaire (see Table A.2 in the Appendix). Scores on each dimension were z-standardized.

With regard to the local context, we use locality-level information on labor market and institutional characteristics, such as type of locality (rural, urban or refugee camp), unemployment and poverty rates, whether the locality is affected by the separation wall, and the proportion of a locality under area C.<sup>6</sup> Localities are the smallest administrative units defined by the Palestinian Central Bureau of Statistics (PCBS) based on their economic inter-linkages. There are 528 localities overall in the West Bank. Data on such a low geographic level are available only occasionally. For instance, locality-level unemployment rates are available only for 2007 and are drawn from the PCBS. Information on unemployment for localities in East Jerusalem comes from the Applied Research Institute Jerusalem (ARIJ, 2014) and the Jerusalem Institute for Israel Studies. Poverty rates (available for 2009 only), the proportion of the locality under area C, and information on whether a locality is affected by the separation wall are obtained from the World Bank (Vishwanath et al.,

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<sup>5</sup>The SDQ exists in three versions, to be answered by children, teachers, and parents, respectively, and is validated in many languages, including Arabic (see [www.sdqinfo.org](http://www.sdqinfo.org)). In this paper, we use the parent-reported version included in the parental background questionnaire.

<sup>6</sup>Since 1995, the West Bank is divided into three areas: A, B and C. Figure 1 shows a map of the West Bank and the geographical division of Palestinian territories into those areas. The Palestinian National Authority (PNA) has control over both administration (e.g., health, education, sanitation, water, and taxation) and security in area A, whereas control by the PNA is limited to administration in area B, and is absent in area C (Vishwanath et al., 2014). Communities in area C are at higher risk of adverse life circumstances due to the lack of primary services (UNSCO, 2014).

2014). These contextual variables are then merged with the individual-level data using information on the residence of the household living in a locality.

Our most important contextual variable is the number of Palestinian fatalities at each child's school locality from September 2000 to February 2005, and is drawn from B'Tselem. These data measure local area conflict intensity during the Second Intifada. While the measures of conflict intensity used in the literature differ considerably,<sup>7</sup> the number of conflict-related Palestinian victims can be regarded as the best proxy for Palestinian exposure to conflict in the West Bank during the Second Intifada (Amodio & Di Maio, 2016).

Our analytical sample is constructed as follows: only observations with missing data for students' achievement in primary school and households' experience of political violence are excluded from the analysis. To minimize the loss of observations, missing values in any other variable are substituted by mean values. Additionally, an indicator for such missing values is created.<sup>8</sup> After these restrictions, we obtain a working sample that contains 4,235 children in grades 5 to 9 enrolled in 98 primary schools located across 74 distinct localities throughout the West Bank.<sup>9</sup>

Table 1 reports descriptive statistics on the main variables used in the analysis. It consists of three panels, Panel A for the sample at the individual level, and Panel B and C for the corresponding samples at the school level and locality level, respectively. The children in our sample are on average 12.8 years old, and 70% are girls. Their GPA is on average 67.8 points and has a standard deviation of 17.6 points. On average, parents report to have been exposed to 0.45 conflict-related incidents during the Second Intifada.<sup>10</sup> 41% of children in our sample have refugee status, meaning they are descendants of families who have been displaced after the 1948 Palestine war. 25% of fathers and 19% of mothers have a college degree, and 37% of fathers and 39% of mothers have a high school diploma. As regards children's mental health and personality, we show summary statistics before standardization. Children score, on average, 12.6 in terms of total difficulties, 6.1 in terms of "internalizing" symptoms, and 6.5 in terms of "externalizing" problems. These averages are fairly high compared to the corresponding figures from Western countries. For example, in the US children of the same age score on average 7.1 in terms of total difficulties, 4.0 in terms of "externalizing" problems and 3.0 in terms of "internalizing" symptoms (see [www.sdqinfo.org](http://www.sdqinfo.org)).

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<sup>7</sup>For example, Di Maio & Nandi (2013) use the number of closure days, Calì & Miaari (2013) employ the number of IDF check points in the West Bank, and Eckstein & Tsiddon (2004) utilize the number of Israeli victims of Palestinian attacks in Israel.

<sup>8</sup>While the inclusion of these observations does not substantially affect the point estimates, it does improve the precision of our estimates.

<sup>9</sup>Data from two schools which did not collect household questionnaires (containing information on households' exposure to conflict) had to be dropped from our sample.

<sup>10</sup>Approximately 40% of the households have reported at least one violent event, and among those who have reported at least one event, 95% have reported that their house was searched. This is by far the most common violent event experienced by the students' households during the Second Intifada.



Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min.	Max.
Panel A: Individual-level. Observations: 4,235				
School achievement (2012/2013)	67.8	17.6	7.2	99.5
Family exposure to conflict	0.45	0.85	0	4
Child's age in years	12.8	1.5	10	18
Girl	0.70	0.46	0	1
Refugee status	0.41	0.49	0	1
Mother's age	39.5	6.0	24	65
Father's age	44.7	6.6	27	91
High school diploma (mother)	0.39	0.49	0	1
College degree (mother)	0.19	0.40	0	1
High school diploma (father)	0.37	0.48	0	1
College degree (father)	0.25	0.43	0	1
Cognitive test score	0.62	0.17	0	0.94
Numerical test score	0.62	0.21	0	1
Figural test score	0.58	0.19	0	0.97
Verbal test score	0.64	0.16	0	0.95
SDQ total score	12.6	5.7	0	34
Internalizing problems	6.1	3.1	0	17
Externalizing problems	6.5	3.6	0	19
Conscientiousness	3.9	0.9	1	5
Extraversion	3.3	0.7	1	5
Openness	4.0	0.8	1	5
Neuroticism	3.2	0.9	1	5
Agreeableness	3.8	0.8	1	5
Panel B: School-level. Observations: 98				
UNRWA school	0.41	0.49	0	1
Panel C: Locality-level. Observations: 74				
Fatalities	12.0	34.5	0	229
Separation wall	0.43	0.50	0	1
Locality under Area C	0.32	0.33	0	1
Poverty rate 2007	0.22	0.12	0.02	0.50
Unemployment rate	0.17	0.08	0.02	0.40
Locality: Rural	0.42	0.50	0	1
Locality: Refugee Camp	0.18	0.38	0	1

*Notes:* All the samples contain children for whom information on school achievement and their exposure to conflict during the Second Intifada is not missing. To minimize the loss of observations, missing entries in any other covariate are replaced using mean values. Accordingly, an indicator for such missing values is created. \*, The mental health and personality variables are not standardized.

### 3 Empirical Specification and Identification Strategy

The primary focus of this paper is to estimate the effects of parents' exposure to conflict on their children's educational attainment. To this end, we estimate the following linear model for student school achievement:

$$Y_{isl} = \alpha + \beta \text{Exposure}_{isl} + \gamma X_{isl} + \xi U_{sl} + \lambda Z_l + \varepsilon_{isl} \quad (1)$$

where the index  $isl$  denotes a child  $i$  enrolled in primary school  $s$  and residing in locality  $l$  at the year of interview. The outcome variable  $Y_{isl}$  represents GPA of child  $i$  for the school year 2012/2013.

Our variable of interest is  $\text{Exposure}_{isl}$ , defined as the number of violent events during the Second Intifada reported by the household respondent (child's mother or father) and detailed in the previous section. Thus,  $\beta$  captures the impact on student GPA at the interview year of an additional event of parents' exposure to political violence at least seven years earlier.  $X_{isl}$  is a vector of individual covariates, including a child sex, refugee status, dummies for children's and parental age, indicators for the maximum of father's and mother's educational level as well as indicators for missing values of these covariates.  $U_{sl}$  is a school type indicator (UNRWA vs. public school).  $Z_l$  is the set of locality-level labor market and institutional characteristics, such as unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, and type of locality (rural, urban or refugee camp). Finally,  $\varepsilon_{isl}$  represents an idiosyncratic error term.

The need for an identification strategy arises from the potential correlation of household experience of violence during the Second Intifada with various unobservable determinants of student achievement. Such correlation, in particular related to family background characteristics but also education infrastructure, may confound our relationship of interest. One obvious concern might be, for example, that richer and better educated families – who have children of better academic ability – may reside in certain areas less prone to Palestinian violence that may have provoked counter-violence by the IDF. While we are able to control for observed background characteristics to address this concern, there may still be unobserved confounders.

We therefore apply an IV strategy to identify the long-term effect of household exposure to conflict on children's primary school achievement, with the number of Palestinian fatalities at the locality level being used as instrument for family exposure to conflict. However, since the present analysis focuses on the long-term academic outcomes of children, seven years after the conclusion of the conflict, we can exploit only the cross-locality variation in the total number of Palestinian victims (and not the variation over time within the locality during the Second Intifada) to identify the effect of family exposure to conflict. Thus, one potential threat to the validity of our instrument is the omitted variable bias resulting from the presence of time-invariant unobservable factors at the locality level correlated with both conflict intensity and child primary education performance. We argue that this problem is substantially mitigated by controlling for locality-level contextual variables.

Model (1) is estimated using two stage least squares (2SLS), with the following first stage regression:

$$\text{Exposure}_{isl} = \eta + \delta \text{Fatalities}_l + \theta X_{isl} + \zeta U_{sl} + \sigma Z_l + v_{isl} \quad (2)$$

where  $\text{Exposure}_{isl}$  is regressed on  $\text{Fatalities}_l$ , defined as the locality-level number of all conflict-related Palestinian victims during the Second Intifada.  $X_{isl}$ ,  $Z_l$ , and  $U_{sl}$  are defined in the same way as in Equation (1). Standard errors are clustered by locality, the level of variation of our instrument.

To illustrate the variation of our instrument, Figure 1 shows a map of the West Bank. Each circle represents a locality contained in our sample. The size of the circle indicates the locality-level number of Palestinian fatalities during the Second Intifada. Overall, Figure 1 shows a substantial degree of variation in the number of Palestinian fatalities, with the highest levels of conflict intensity being concentrated in some very violent localities, such as Nablus, Jenin, Tulkarm, Hebron and Ramallah. Figure 2 shows the relationship between the total number of fatalities during the Second Intifada at the governorate level (there are 11 governorates in the West Bank) and the average level of exposure to conflict as reported by parents. This graph reflects the (first stage) variation we exploit in our analysis.

## 4 Results

### 4.1 Main Results

Table 2 reports the estimates of the effects of an increase in household exposure to conflict during the Second Intifada on children’s primary school achievement obtained from an OLS regression (Column 1) and from a 2SLS regression (Column 4). In addition, we show the corresponding results from the reduced form (Column 2) and first stage (Column 3) regressions. As described in the previous section, in each regression we include individual-level, school-level, and locality-level control variables.

The OLS coefficient suggests a negative and significant association between households’ exposure to conflict and their children’s school performance: an additional event of parents’ experience of conflict is associated with a 1.32 point decrease in student GPA in primary school, which corresponds to approximately 8% of a standard deviation. The reduced form regression suggests that GPA drops by approximately two points per one hundred fatalities in the locality.

The first stage regression shows that one hundred more fatalities in the locality increase parents’ exposure to conflict by 0.35 events on average. With a first stage F-statistic of 46, our instrument easily passes conventional thresholds for strong instruments. The 2SLS coefficient on parents’ exposure to conflict remains negative and statistically significant, and is larger than our OLS estimate. We find that one additional event of parents’ exposure to conflict induced by the Second Intifada reduces the primary school GPA of their children by 5.74 points. This effect represents a decline of about 30% of a standard deviation.

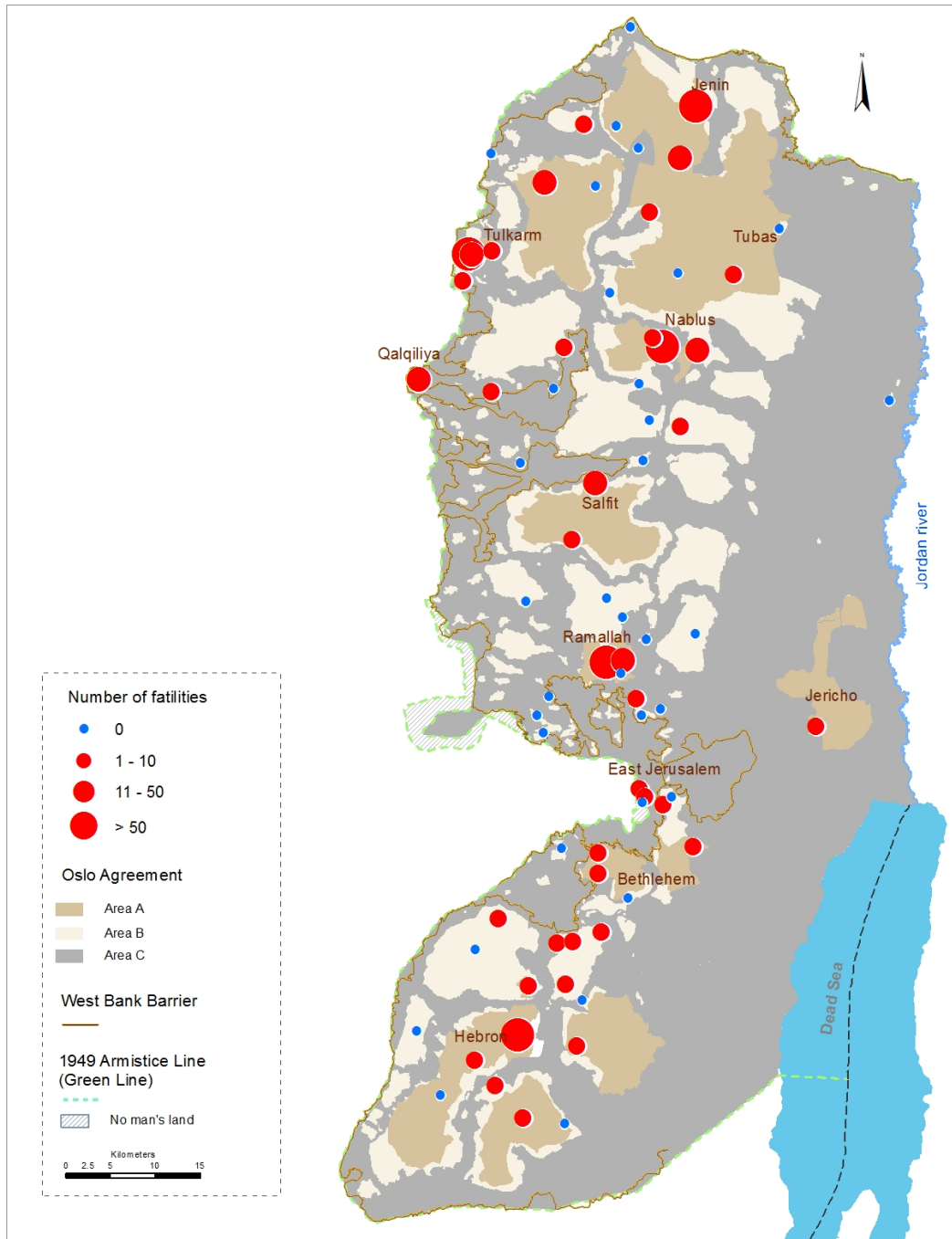


Figure 1: Map of the West Bank, school locations and the number of Palestinian fatalities during the Second Intifada

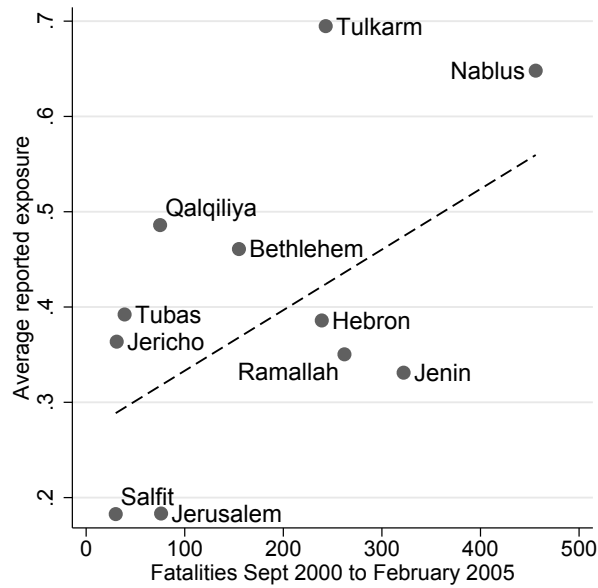


Figure 2: Correlation between average exposure (number of reported events) and total number of Second Intifada fatalities, by governorate

As previously mentioned, we also estimate a range of regressions with alternative operational definitions of the exposure variable, obtaining very similar results. Details can be found in Table B.1 in the Appendix. Importantly, as shown in Columns E and F, our instrument does not predict exposure to conflict before or after the Second Intifada. We interpret this as evidence that the instrument does not pick up any trends in location-specific levels of violence.

## 4.2 Robustness Checks

We assess the robustness of our main results to a number of further specification changes. Results are reported in Table 3. First, in Column (1) we check the sensitivity of our results to a change in the functional form of the first stage and reduced form regressions. The major concern here is that exposure to conflict and GPA may not follow linear functions of the number of fatalities. To allow for this possibility, we have recoded our instrument into 4 categories (as shown in Figure 1): 0 fatalities, 1-10 fatalities, 11-50 fatalities, and >51 fatalities. Our point estimate changes somewhat, we lose precision and the first stage F-statistic decreases, but the qualitative result remains.

Second, to investigate heterogeneous effects across the distribution of GPA, in Columns (2) to (4) we report the treatment effects at the 25th, 50th and 75th percentile. Our results suggest that the effect of family exposure to conflict induced by the Second Intifada is concentrated in the lower quantiles of the GPA distribution. In other words, the long-term effects of family exposure to conflict induced by the Second Intifada seem to be driven by poor academically performing students.

Third, another concern regards the sensitivity of our findings with respect to the year in which school achievement in primary school is measured. As previously mentioned, our dataset provides information on student GPA not only for the school year 2012/2013 but also for the two preceding

Table 2: Effects of Family Exposure to Conflict on Children’s Primary School GPA, Main Specification

Dep. Var.:	(1)	(2)	(3)	(4)
	OLS Child GPA	Reduced form Child GPA	First stage Family exposure to conflict	2SLS Child GPA
Family exposure to conflict	-1.32*** (0.26)	—	—	-5.74*** (1.60)
Fatalities (in hundreds)	—	-2.04*** (0.59)	0.35*** (0.05)	—
First stage F statistic			46.12	46.12
Mean of dep. var.	67.83	67.83	0.45	67.83
SD of dep. var.	17.63	17.63	0.85	17.63
Individual-level controls	Yes	Yes	Yes	Yes
School-level controls	Yes	Yes	Yes	Yes
Locality-level controls	Yes	Yes	Yes	Yes
N obs.	4,235	4,235	4,235	4,235

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include sex of child, sex of household respondent, dummies for children’s and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. The school-level control variable is an indicator for UNRWA versus public school. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

school years, i.e., 2010/2011 and 2011/2012. Hence, we run two additional 2SLS regressions of model (1) using student GPA for the school years 2010/2011 (Column 5) and 2011/2012 (Column 6) as alternative outcomes. Results remains qualitatively unchanged relative to the main specification: the coefficient on family exposure to conflict has negative and significant effects on children’s GPA in primary school. Note, however, that point estimates are actually smaller in the two earlier years than in 2012/13. This suggests that effects on student GPA do not tend to subside over time. We interpret this as corroborating evidence for the plausibility and usefulness of our long-term analysis.

Fourth, in Column (7) we verify the robustness of our results when using a broader measure of conflict intensity that includes the locality-level number of all Palestinian *and* Israeli victims during the Second Intifada. The reason for this check is that both sides of the conflict may react in a regular and predictable way to violence against them. This would imply that an increase in the number of conflict-related Israelis fatalities may lead to more violent actions against the civilian population in the West Bank. Again, the estimated parameter resembles closely the one obtained in the benchmark specification.

Next, we check what happens when we include governorate fixed effects (Column 8) in model (1). Identification then rests on within-governorate variation in the intensity of conflict. Differences in exposure to violence or children’s educational attainment that are linked to the larger region are

hence controlled for – addressing potential concerns about the validity of our instrument. Again, we find that the point estimate hardly changes. Standard errors increase a bit, but the first stage F-statistic remains safely above 20. In a related robustness check, we exclude single governorates one at a time to examine whether the results are driven by a specific governorate. This exercise, of which we do not report detailed results, confirms that our main results are robust.

As a final check, in Columns (9) and (10) we split the sample in two parts based on the date of birth of the children in our sample. Specifically, in Column (9) we restrict the sample to all children born before February 2000. These children have attended school for at least one year during the Second Intifada. One might argue that some part of the effect we measure is not due to parental exposure to conflict but rather to disruptions to teaching, such as closing of schools, detainment of teachers, road closures keeping children from reaching schools and so on (Brück et al., 2014). In Column (10) we focus on children born in February 1999 or later, who have entered school in September 2005 (after the end of the Second Intifada), and whose schooling has not been directly affected by the conflict. Taken together, the results in Columns (9) and (10) do not provide any evidence for differential effects of household exposure to conflict by date of birth.

## 5 Potential Mechanisms

We now turn to discussing potential mechanisms underlying the relationship between family exposure to conflict and primary school achievement of children. We hypothesize that exposure to conflict and violence in the early stages of a child’s development may have long-term detrimental consequences on both cognitive and non-cognitive skills, which in turn translate into worse school outcomes. Our hypothesis is consistent with a recent strand of the literature suggesting that non-cognitive skills have predictive power for a wide range of socio-economic outcomes. For instance, Heckman et al. (2006) show that non-cognitive skills – among which personality traits are included – are important determinants of academic and economic success, and that their long-run effects seem comparable to the ones of cognitive skills. Currie & Stabile (2009) argue that non-cognitive skills can partly be interpreted as mental health conditions. They show that mental health problems in early childhood, in particular those associated with “externalizing” and “internalizing” behavior problems, have negative and persistent effects on future educational outcomes.

With our data, we are not able to completely identify the causal path from exposure to conflict to educational attainment via impaired cognitive and non-cognitive skills. However, we are able to study if – using the same identification strategy as before – exposure to conflict causally impacts these mediating variables. Finding no effect would rule out certain candidate channels.

Before we report the results of 2SLS regressions with the mediators as dependent variables, we show that they have an effect on educational attainment at least in a descriptive sense. As regards cognitive ability, we consider the sub-scores for numeracy, verbal and figures, as well as the total score obtained in the three tests; as concerns non-cognitive skills, we use the score for total strengths and difficulties (SDQ), the corresponding sub-scores for “internalizing” and “externaliz-

Table 3: Robustness Checks, 2SLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Categorical Instrument		Distribution		Earlier years		All Fatalities	Province Fixed Effects	during 2nd I.	In school after 2nd I.
	Top 75%	Top 50%	Top 25%	GPA 10/11	GPA 11/12	Fatalities	Province	during 2nd I.	after 2nd I.	
Family exposure to conflict	-4.07* (2.20)	-0.12*** (0.04)	-0.14*** (0.04)	-0.02 (0.04)	-4.45*** (1.31)	-3.68*** (1.31)	-5.74*** (1.65)	-4.64 (2.87)	-5.17* (3.01)	-5.86*** (1.95)
First stage F statistic	10.3	46.1	46.1	46.1	45.8	46.1	61.3	31.6	33.6	45.1
Mean of dep. var.	67.8	0.75	0.50	0.25	72.7	70.5	67.9	67.8	65.8	69.2
SD of dep. var.	17.6	0.43	0.50	0.43	16.0	15.9	17.6	17.6	17.8	17.4
Individual-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N obs.	4,235	4,235	4,235	4,235	4,206	4,231	4,235	4,235	1,737	2,498

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include a female dummy for children and parents, dummies for children's and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.



ing” behavior problems, as well as the Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness and neuroticism).

Table 4 shows the results of OLS regressions of GPA on z-standardized measures of cognitive ability, scores for internalizing and externalizing problems, as well as the Big 5 personality dimensions. Column (1) shows the results of twelve separate regressions, where each mediating variable is included one at a time. As expected, cognitive ability is strongly related to GPA. Moreover, all measures of non-cognitive skills are significant predictors of GPA as well. Since the coefficients show the estimated association in terms of standard deviation changes, a comparison of the size of the coefficients illustrates the quantitative relevance of non-cognitive skills. For instance, externalizing problems and conscientiousness are about half as strong predictors as cognitive skills.

Column (2) shows results when the cognitive ability sub-scores and the SDQ sub-scores are included jointly. We find that the influence of internalizing problems disappears almost completely. The coefficient on externalizing problems becomes smaller but remains strong. In Column (3) we report the results when the Big 5 and cognitive ability are included jointly, and we find that conscientiousness remains the only personality trait with a sizeable association with GPA. Overall, cognitive and non-cognitive skills have independent “effects” on children’s educational achievement. The most important non-cognitive skills are conscientiousness and (the absence) of externalizing, i.e. behavioral, problems.

To establish whether these variables lie on the causal path from exposure to conflict to GPA, we now estimate the same specification as in model (1) with children’s cognitive and non-cognitive skills as outcomes. We report the results of this analysis in Table 5. When examining cognitive ability (Panel A), we do not find any significant effects, with the magnitude being close to zero for numeracy and positive coefficients for the figural and verbal tests. In contrast, the results for non-cognitive skills (Panel B) reveal that family experience of conflict increases children’s SDQ total score by 0.2 standard deviations. This coefficient masks heterogeneous effects between “internalizing” problems (Column 2), where our coefficient of interest remains positive but the magnitude is substantially reduced, and “externalizing” behavior problems (Column 3), for which we find a significant 0.25 standard deviations effect of family exposure to conflict. This evidence is in line with the results of Currie & Stabile (2006, 2009), who find that “externalizing” behavior problems are more likely to lead to negative outcomes than “internalizing” problems. We therefore believe that increased “externalizing” behavior problems may be one important channel through which exposure to conflict at least seven years in the past affects children’s GPA today.

We now move to the examination of the Big Five personality traits (see Columns 4 to 8 of Panel B). Our main result is that parents’ exposure to conflict during the Second Intifada reduces children’s level of conscientiousness by 0.23 standard deviations. In light of the evidence reported in Table 4, this finding suggests another important channel, possibly related to the “externalizing” problems channel. Extraversion, agreeableness and neuroticism also seem to be affected by family exposure to conflict. However, as demonstrated in Table 4, these personality traits show no significant correlation with GPA, once cognitive skills and the other personality dimensions are controlled for. The remaining personality trait, openness, is instead not affected by the exposure to conflict.

Table 4: Effects of Child Cognitive and Non-Cognitive Skills on GPA, OLS Estimates

Dep. Var.:	(1)	(2)	(3)
	Child GPA Separate regressions	Child GPA Joint regression	Child GPA Joint regression
Cognitive ability	7.73*** (0.52)	—	—
Numeracy	6.01*** (0.43)	1.79*** (0.48)	1.71*** (0.45)
Figural	6.23*** (0.42)	1.51*** (0.35)	1.62*** (0.35)
Verbal	7.46*** (0.47)	4.52*** (0.44)	4.56*** (0.45)
SDQ total	-3.75*** (0.24)	—	—
Internalizing	-2.28*** (0.26)	-0.26 (0.23)	—
Externalizing	-3.94*** (0.23)	-2.68*** (0.26)	—
Openness	2.48*** (0.25)	—	0.70*** (0.21)
Conscientiousness	3.22*** (0.24)	—	2.11*** (0.25)
Extraversion	-0.56** (0.24)	—	-0.17 (0.21)
Agreeableness	1.19*** (0.21)	—	-0.17 (0.19)
Neuroticism	-0.90*** (0.23)	—	-0.05 (0.22)
Individual-level controls	Yes	Yes	Yes
School-level controls	Yes	Yes	Yes
Locality-level controls	Yes	Yes	Yes
N obs. (minimum)	4,059	4,051	4,114

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. All explanatory variables were z-standardized. Individual-level controls include children's age and month of birth, parental age, gender of parents and children, and parental education. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 5: Effects of Family Exposure to Conflict on Children's Cognitive and Non-cognitive Skills, 2SLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Panel A: Cognitive skills</b>								
Dep. Var.:	Total	Numeracy	Figures	Verbal				
Family exposure to conflict	0.04 (0.18)	-0.04 (0.19)	0.12 (0.19)	0.00 (0.16)				
First stage F statistic	46.1	46.1	46.1	46.1				
Mean of dep. var.	0	0	0	0				
SD of dep. var.	1	1	1	1				
N obs.	4,235	4,235	4,235	4,235				
<b>Panel B: Noncognitive skills</b>								
Dep. Var.:	SDQ	Internalizing	Externalizing	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Family exposure to conflict	0.20** (0.09)	0.06 (0.08)	0.25*** (0.10)	0.01 (0.08)	-0.23* (0.12)	0.19** (0.08)	-0.20** (0.09)	0.17** (0.09)
First stage F statistic	64.3	57.7	63.1	50.5	48.8	46.7	51.3	50.6
Mean of dep. var.	0	0	0	0	0	0	0	0
SD of dep. var.	1	1	1	1	1	1	1	1
N obs.	4,089	4,118	4,097	4,172	4,186	4,204	4,188	4,183
Individual-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include a female dummy for children and parents, dummies for children's and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## 6 Discussion and Conclusion

While several studies from a variety of different countries have provided estimates of the short-term consequences of exposure to conflicts on children's educational achievement, less is known about the existence of a causal relationship in the long-run. This paper contributes to the previous literature by showing that household exposure to conflict during the Second Intifada has had long-term impacts on the human capital of students in the West Bank. Specifically, we examine the effect of house searches or occupations by the Israeli army between 2000 and 2005 on students' grade point averages in primary school (grades 5 to 9) during the school year 2012/13.

Our empirical strategy exploits the variation in the locality-level number of Palestinian fatalities during the Second Intifada as an arguably exogenous determinant of a family's exposure to conflict-related events. According to our estimates, one additional event reduces their children's GPA by approximately 30% of a standard deviation of the grade point average distribution. This result is quantitatively robust to a number of specification changes, such as different definitions of the exposure variable, using a categorical instead of a continuous instrument, including Israeli fatalities as well in our instrument, or using GPAs in different school years. We also show that the effect of exposure to conflict is concentrated in the bottom and middle of the GPA distribution. In contrast, only small insignificant effects can be shown for the likelihood of being in the top quartile of the distribution.

Although we have no theoretical prior as to the direction in which OLS would be biased compared to the true causal effect of exposure, the size of our 2SLS coefficients may raise concerns about the validity of our results. Large 2SLS- compared to OLS-estimates are quite common in applied research and three explanations can be put forward. The first one is measurement error in the explanatory variable, which (if classical) attenuates the OLS coefficients. Clearly, if some households who have experienced violence do not report this in our survey, whereas others over-report events, *and* if misreporting is uncorrelated with the error term, OLS estimates would be biased towards zero. However, it seems at least equally plausible to assume that misreporting is related to unobserved determinants of student achievement. The second explanation is that the IV approach identifies complier-specific causal effects, which can potentially be larger than OLS estimates. However, in the present study it is unclear what compliance means since exposure to house searches or occupations by the Israeli army are unlikely to be choice variables.

A third explanation – potentially damaging to the IV approach – is that the exclusion restriction does not hold. Of course, this cannot be entirely ruled out in our setting. To partially address this concern, we report the reduced form coefficients for all specifications in Tables B.2 and B.3 in the Appendix. These results clearly show that locality-level conflict intensity during the Second Intifada is associated with worse educational attainment more than seven years later, and that this association is robust to a number of specification changes. Thus, even if one would not believe our IV results, we provide robust evidence that the Israeli-Palestinian conflict has long-term consequences. This reduced form analysis is similar to what most of the literature has done when data on individual experience of conflict are lacking (see, for instance, Brück et al. (2014)).

Our data include measures of cognitive and non-cognitive skills that allow us to uncover the mechanisms underlying the relationship between family exposure to conflict and children’s educational attainment. We find no effect of exposure on the performance in a long and detailed cognitive skills (IQ) test. In contrast, important non-cognitive correlates of educational achievement, such as externalizing behavior problems and conscientiousness, appear to be affected. This finding provides an interesting mirror image of findings on the effect of early education programs. For instance, with regard to the Perry Preschool Program, Heckman et al. (2013) conclude: “Although Perry did not produce long run gains in IQ, it did create persistent improvements in personality skills. The Perry program substantially improved externalizing behaviors (aggressive, antisocial, and rule-breaking behaviors)” (p. 2053). It almost appears as if exposure to conflict did the same – with a negative sign: although exposure is not detrimental to IQ, it leads to worse personality skills, which in turn affect educational attainment and other future outcomes.

In terms of policy, our paper suggests that children whose families have been exposed to conflict should be identified and invited to participate in interventions that are designed to improve social skills and self-control. Such interventions will likely lead to better educational attainment in school and possibly better labor market outcomes. When this is not possible during a conflict, children should be the main focus of interventions in the post-conflict recovery period.

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## A Description of non-cognitive skills measures

Table A.1: Strengths and Difficulties (SDQ) Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best as you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behavior over the last six months.

Panel A: Internalizing Problems	
Emotional symptoms	...often complains of headaches, stomach-aches or sickness
Emotional symptoms	...worries or often seems worried
Emotional symptoms	...often fights with other children or bullies them
Emotional symptoms	...is nervous or clingy in new situations, easily loses confidence
Emotional symptoms	...fears, easily scared
Peer relationship problems	...is rather solitary, prefers to play alone
Peer relationship problems	...has at least one good friend
Peer relationship problems	...generally liked by other children
Peer relationship problems	...picked on or bullied by other children
Peer relationship problems	...gets along better with adults than with other children
Panel B: Externalizing Problems	
Conduct problems*	...often fights with other children
Conduct problems	...often loses temper
Conduct problems	...generally well behaved, usually does what adults request
Conduct problems	...often lies or cheats
Conduct problems	...steals from home, school or elsewhere
Hyperactivity/inattention	...restless, overactive, cannot stay still for long
Hyperactivity/inattention	...constantly fidgeting or squirming
Hyperactivity/inattention	...easily distracted, concentration wanders
Hyperactivity/inattention	...can stop and think things out before acting
Hyperactivity/inattention	...good attention span, sees work through to the end

*Notes:* Parents were asked to state how much they agreed with each statement about their child on a 3-point scale ("Not true", "Somewhat true", "Certainly true"). Both internalizing and externalizing problems are defined on a 0 to 20 scale. The total score for SDQ is given by the sum of subscores for internalizing and externalizing problems (on a 0 to 40 scale), and does not include the prosocial behavior score (Goodman, 1997). \* This conduct problem was accidentally omitted of the instrument, i.e., the scale representing conduct problems consists only of four items and was scaled up to a maximum of 10.

Table A.2: Big-5 Personality Questionnaire (15 Item Version)

Below are some statements that may or may not describe what your child is like. For each statement, please indicate how much you agree or disagree that it describes your child. I see my child as someone who...

	(Dimension)
1. Is talkative	Extraversion
2. Does things carefully and completely	Conscientiousness
3. Is original, comes up with new ideas	Openness
4. Reserved; keeps thoughts and feelings to self	Extraversion [-]
5. Has a forgiving nature	Agreeableness
6. Worries a lot	Neuroticism
7. Has an active imagination	Openness
8. Tends to be lazy	Conscientiousness [-]
9. Likes artistic and creative experiences	Openness
10. Is considerate and kind to almost everyone	Agreeableness
11. Does things efficiently (quickly and correctly)	Conscientiousness
12. Stays calm in tense situations	Neuroticism [-]
13. Is outgoing, sociable	Extraversion
14. Gets nervous easily	Neuroticism
15. Is sometimes rude to others	Agreeableness [-]

*Notes:* Parents were asked to state how much they agreed with each statement on a 5-point Likert scale

## B Supplementary tables and figures

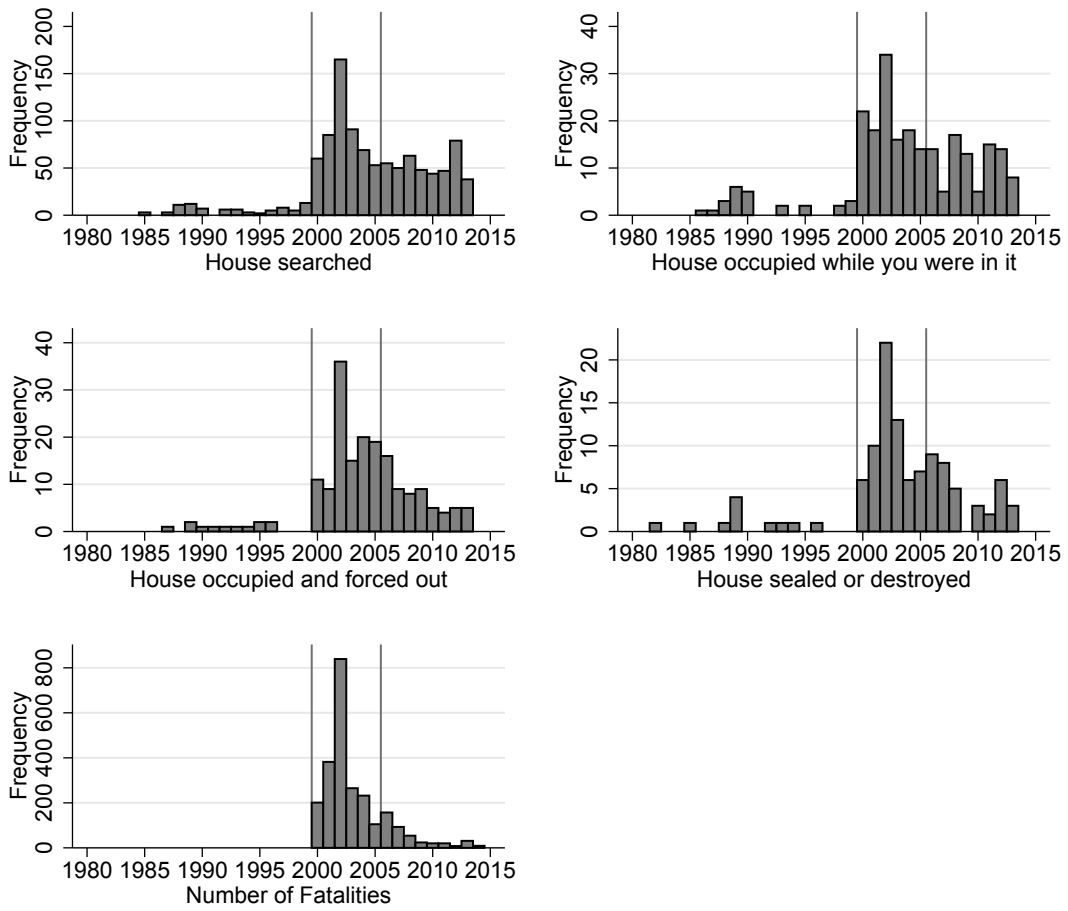


Figure B.1: Self-reported years of exposure to conflict and number of fatalities by year

Table B.1: Effects of Family Exposure to Conflict on GPA, 2SLS Estimates, Alternative Definitions of Exposure

*Specifications:* (A) Raw number of events (all periods); (B) Raw number of events (during 2nd Intifada – valid dates only); (C) Raw number of events (2nd Intifada + missing dates); (D) Raw number of events (missing dates only); (E) Raw number of events (pre 2nd Intifada); (F) Raw number of events (post 2nd Intifada), (G) Exposure severity (all periods); (H) Exposure severity (2nd Intifada only); (I) Binary exposure: house occupied or worse; (J) Exposure score based on principal components analysis; (K) Number of distinct events during 2nd Intifada (with dates more than 6 months apart).

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Family exposure to conflict	-5.95*** (1.78)	-10.80*** (3.36)	-5.74*** (1.60)	-12.26*** (4.33)	158.69 (113.87)	-4575 (251609)	-5.09*** (1.53)	-5.05*** (1.44)	-18.82*** (5.39)	-6.02*** (1.69)	-11.87*** (3.35)
First stage F statistic	28.23	67.62	46.12	9.93	1.71	0.00	24.03	35.77	52.13	49.20	27.02
Mean of dep. var.	67.83	67.83	67.83	67.83	67.83	67.83	67.83	67.83	67.83	67.83	67.83
SD of dep. var.	17.63	17.63	17.63	17.63	17.63	17.63	17.63	17.63	17.63	17.63	17.63
N obs.	4,235	4,235	4,235	4,235	4,235	4,235	4,235	4,235	4,235	4,235	4,235

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include a female dummy for children and parents, dummies for children's and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table B.2: Robustness Checks, Reduced Form Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Categorical Instrument	Top 75%	Distribution Top 50%	Top 25%	Earlier years GPA 10/11	GPA 11/12	All Fatalities	Province Fixed Effects	during 2nd I.	In school after 2nd I.
Fatalities (in hundreds)	—	-0.04** (0.02)	-0.05*** (0.02)	-0.01 (0.01)	-1.58*** (0.49)	-1.30*** (0.49)	-1.86*** (0.54)	-1.43 (0.93)	-1.80* (1.05)	-2.06*** (0.76)
Mean of dep. var.	—	0.75	0.50	0.25	72.7	70.5	67.9	67.8	65.8	69.2
SD of dep. var.	—	0.4	0.5	0.4	16.0	15.9	17.6	17.6	17.8	17.4
Individual-level controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School-level controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality-level controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N obs.	—	4,235	4,235	4,235	4,206	4,231	4,235	4,235	1,737	2,498

Notes: Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include a female dummy for children and parents, dummies for children's and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table B.3: Effects of Family Exposure to Conflict on Children's Cognitive and Non-cognitive Skills, Reduced Form Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<b>Panel A: Cognitive skills</b>							
Dep. Var.:	Total	Numeracy	Figures	Verbal				
Fatalities (in hundreds)	0.02 (0.06)	-0.01 (0.07)	0.04 (0.06)	0.00 (0.06)				
Mean of dep. var.	0	0	0	0				
SD of dep. var.	1	1	1	1				
N obs.	4,235	4,235	4,235	4,235				
	<b>Panel B: Noncognitive skills</b>							
Dep. Var.:	SDQ	Internalizing	Externalizing	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Fatalities (in hundreds)	0.42** (0.17)	0.06 (0.09)	0.33*** (0.11)	0.00 (0.02)	-0.07** (0.03)	0.05** (0.02)	-0.06** (0.03)	0.05** (0.03)
Mean of dep. var.	0	0	0	0	0	0	0	0
SD of dep. var.	1	1	1	1	1	1	1	1
N obs.	4,089	4,118	4,097	4,172	4,186	4,204	4,188	4,183
Individual-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Notes:* Standard errors are reported in parentheses and are clustered at the locality level. Individual-level controls include a female dummy for children and parents, dummies for children's and parental age, dummies for parental educational levels, as well as indicators for missing values in these covariates. Locality-level variables contain unemployment rate, poverty rate, the proportion of locality under area C, the presence of the separation wall, as well as indicators for UNRWA school and type of locality (rural, urban or camp). \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.