Too Scared for School? The effects of terrorism on Israeli student achievement

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Job Market Paper

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1 Introduction

In recent years the frequency of terror attacks has increased not only in traditionally terrorism-stricken countries but in many western countries as well. It is a well known fact that terrorism has society-wide consequences that extend far beyond the immediate victims of the violence. Many studies have analyzed the effects of terrorist acts on various aspects of the economy and society (See Frey et al., 2007 for an overview of studies that analyze the effect of terrorism on economic factors). However, very little attention has been given to the effect of terrorism on education and human capital, which are fundamental to economic and social development.

Although the likelihood of an individual's being harmed by terrorism is negligible, terror attacks generate a disproportionate amount of stress and fear (Whalley and Brewin, 2007). Psychiatric and psychological studies show that children and adolescents who experience terror events, either as direct victims or as indirect victims through visual and other media descriptions, have a higher risk of developing symptoms of anxiety and stress which are occasionally accompanied by depression, aggressive behavior, social and emotional problems, and impaired cognitive development.[1] As these effects may influence students' performance in the short term, it may also affect long term outcomes which are determined by academic achievements.[2]

This paper offers an empirical analysis of the immediate effect of terrorism on academic achievement. Specifically, I study the effect of fatal terror attacks during the Second Intifada in Israel (2001-2005) on students' performance in high-stakes high school exit exams. By exploiting the temporal and geographic variation in terror attacks during the Second Intifada and the special structure of the Israeli matriculation system, I am able to control for unobserved confounders at the student level and provide a causal interpretation

[1] Pfefferbaum et al. (1999, 2000); Pfefferbaum (2001); Hoven et al. (2003); Pat-Horenczyk et al. (2007); Schiff et al. (2007); Al-Krenawi (2009); Dimitry (2012) and Duffy et al. (2015).

[2] Note that terrorism does not necessarily have an impact on students' cognitive ability but rather it can affect students' cognitive acuity and, in turn, academic performance on assignments such as tests. For example, psychological studies show that stress can lead to reductions in working memory and cognitive distractions that lead students to perform poorly on tests (Mattarella-Micke and Beilock, 2012; Sauro et al., 2003).

of the effect of terrorism on test scores. My results indicate that the occurrence of a fatal terror attack shortly before an exam in the examinees vicinity has a significant negative impact on performance, where the main transmission of this effect is probably psychological impacts that affect the learning process and cognitive acuity during the exam.

Recent studies have analyzed the effect of terror attacks, or similar community traumatic events (such as mass shootings and drug battles), on students' academic achievements (Bruck et al., 2014; Gershenson and Tekin,2015; Jarillo et al., 2016; Kibris, 2015; Monteiro and Rocha, 2016). These studies find negative effects on academic performance, however, they cannot isolate the exact mechanism for this effect. It can be both due to degradation of school quality and deterioration of student's psychological well-being. Few studies that test the effect of environmental stress due to events of mass shootings or extreme violence on academic performance focus on the effect within the week after the event (Poutvaara and Ropponen, 2010; Sharkey et al., 2014). Although these studies find a significant negative effect on test scores they do not address the potential bias due to selection among students who choose to take the exam after a violent event.

My analysis improves upon existing research along two main dimensions. First, I use the Second Intifada, one of the most intense periods in the Israeli-Palestinian conflict, as the source of terrorism. The frequency and intensity of terror attacks during the Second Intifada showed significant temporal and geographical variation which allows me to eliminate time-invariant effects, and overcome the fact that terror-prone areas are usually different from non-violent ones in other aspects that can also affect education outcomes. While previous studies also exploit temporal and geographical variation in violence, a unique feature of the type of terrorism I use is that, unlike in previous studies, it had negligible, if any, effects on the functioning of the education system in terror-prone regions. Schooling and the education system were never interrupted during the Second Intifada and national exams were never rescheduled due to terror attacks (source: Israeli Ministry of Education).[3] This contrasts with the instability of education systems in developing countries that have been affected by violent conflicts, or countries that have experienced a

[3]Schools throughout Israel were closed only in times of actual war, e.g., the 1990-1991 Gulf War in 1991, and in southern Israel when rocket fire from the Gaza Strip intensified after 2005.

large scale terrorist attack or a long period of war.[4] Second, this study uses a detailed and unique dataset on the Israeli high school exit exams that creates a rare opportunity to evaluate the effect of terrorism not only within areas over time, but also within students. This yields a more straightforward identification of the effect of terrorism-induced stress on academic achievements compared to most of the outcomes in the literature that could be explained by multiple channels of transmission.

The study uses a unique dataset of the Israeli high-school exit (also known as matriculation) exams, merged with detailed data on Israeli fatalities from terror incidents in 2001–2005. It covers nearly two million exam observations of 254,059 Israeli Jewish twelfth-grade students. With detailed information on the time of these exams and the students' locations, I can determine the intensity of terror in a particular geographical location during a specific period preceding the matriculation exam date. My identification strategy exploits the fact that students take multiple matriculation exams over several days in certain months: this allows me to examine the effect of terror on scholastic performance across the same student's exams. The identification assumption is that the time and geographical variation of the terror attacks that Israelis endured during the Second Intifada is random across one student's tests. Using a student fixed effects strategy allows me to control both for unobserved features of the student that might be correlated with the exposure to terror attack before the exam and for other factors associated with the effects of sustained terrorist conflict (for example, teaching quality, students and teachers absences).

I find that a terror attack in the student's area shortly before the exam reduces his or her performance on the exam. In particular, a single additional fatality from a terror attack in a student's vicinity within a five-day window before an exam reduces his or her test score by 0.007 of a standard deviation. The effect is similar across genders, religious orientations (secular or religious), and parents' education. By exploring nonlinear effects I

[4]The attacks that Israel sustained during the Second Intifada were on a moderate scale, causing thirty fatalities at the most (the attack at the Park Hotel in Netanya on March 27, 2002, Passover Eve), paling in comparison with September 11 (with more than 2,500 deaths at the World Trade Center alone) or the train bombings in Spain (almost 200 deaths), which clearly disrupted quotidian routines and functioning of the education system in the short term.

show that the main results are driven predominantly by attacks that claim a relatively high number of fatalities. An attack that causes at least six Israeli fatalities in the student's area reduces his or her test score by 0.12 standard deviation. I show that the effect of terror is transitory, concentrated only in the five days preceding the exam and decreases with the physical distance between the examinee and the attack location. These results may indicate that the main mechanism for the observed effect is stress based on findings from psychological and psychiatric studies (see review by Whalley and Brewin, 2007). According to these studies the prevalence of 'substantial stress' following terrorist attacks is very high mainly in the first few days after the attack and negatively associated with distance from the attack. Given that few examinees in the sample are likely to be at risk of being affected by terror shorty before the exam (less than 2 percent), I conduct a set of robustness and placebo tests to support the validity of my results. I find that there is no meaningful correlation between terror attacks after the exam or more than five days before the exam, and the exam score. My main results are also robust to an alternative identification strategy and to the selection of the sample. Furthermore, I find that terror attacks before examination days have a significant impact on student's academic outcomes in a way that has long-term implications, such as the probability of failure on the exam, failure to obtain a matriculation certificate, and degradation of the matriculation composite score.[5]

This paper contributes to the existing literature in several ways. The main contribution is providing the first analysis of the immediate impact of terrorism on academic achievements where the main transmission of this effect is stress and distraction from learning. My empirical specification enhances my ability to isolate the effects of terrorism from other possible channels of transmission that have been found in previous studies. Additionally, this study provides a novel extension to the literature by analyzing the effect of terrorism on academic outcomes with long term implications. This paper joins a growing body in related literature that uses the exposure to terror as an exogenous source of stress. Most

[5]To matriculate from high school and qualify for admission to academic post-secondary institutions, Israeli students must pass examinations in a range of subjects. Success in these exams also determines access to some academic majors and many lucrative professional programs that require high scores across several subjects.

of the studies in this field analyzed the effect of terrorism on pregnant women and the birth outcomes of their babies (Camacho, 2008; Mansour and Rees, 2012; Brown, 2012; Toledano and Zussman, 2012; Quintana-Domeque and Rodenas-Serrano, 2016). Fewer studies focus on other outcomes such as consumption (Becker and Rubinstein, 2011) and driving behavior (Stecklov and Goldstein, 2004). The study also adds to the literature that analyzes the effect of random disturbances, such as air pollution and college sports events, on cognitive performance during exams that have long-term consequences for the examinees after accounting for their cognitive ability (Lindo et al., 2012 and Ebenstein et al., 2016).[6] Finally, my study breaks new ground by extending the analysis of the effects of the Israeli-Palestinian conflict to the realm of human capital, complementing the broad existing literature on the economic, political, and behavioral consequences of terrorism in Israel.[7]

The rest of this paper is organized as follows. The next section summarizes the related literature. Section 3 provides background on the Second Intifada and the Israeli matriculation exam system. Section 4 describes the data and Section 5 the empirical strategy. Section 6 presents the main empirical results and Section 7 a set of robustness checks. Section 8 discusses possible long term outcomes and Section 9 concludes.

2 Literature Review

Psychological and psychiatric studies investigate the prevalence of 'substantial stress' (the presence of a predetermined level of psychological symptoms) in representative samples of the general population following terrorist events (Vázquez et al, 2006, Schuster et al.,

[6]Ebenstein et al. (2016) find that transitory air pollution exposure on the exam day is associated with a significant decline in student performance. Lindo et al. (2012) find that collegiate football team success significantly impairs non-athlete students' academic performance in the autumn quarter, which coincides with the American football season.

[7]Macroeconomic aggregates (Eckstein and Tsiddon, 2004), financial markets (Eldor and Melnik, 2004, 2010; Zussman and Zussman, 2006), house prices (Hazam and Felsenstein, 2007); tourism (Ben Bassat et al., 2012); individual behavior (Becker and Rubinstein, 2011; Stecklov and Goldstein, 2004); crime (Gould and Stecklov, 2009); Jewish-Arab ethnic discrimination (Shayo and Zussman, 2011; Zussman 2016); Israelis' political attitudes (Berrebi and Klor, 2008, Gould and Klor, 2010, Ben Bassat et al., 2012) and religiosity (Zussman, 2014).

2001; Schlenger et al., 2002). These studies demonstrate that the rate of stress symptoms are extremely high in the first few days after the incident but are already in decline in the first two weeks and by 6-8 weeks have fallen by two-thirds. Moreover, the proportion of people experiencing substantial stress is negatively associated with the distance from the incident. Thus for the majority of individuals significant stress symptoms are temporary and are unlikely to have lasting mental health implications. However, these physiological and emotional responses to acute environmental stress are hypothesized to be linked with outcomes related to cognitive functioning and behavior (e.g., inability to concentrate, reductions in working memory, difficulty sleeping).[8]

Studies on children's stress reactions to terror attacks mainly focus on the developing of Post-Traumatic Stress Disorders (PTSD), but find similar pattern. Pfefferbaum et al., (1999, 2000) and Pfefferbaum (2001) find that middle- and high-school students who experienced direct exposure to the 1995 Oklahoma City bombing were at higher risk of developing PTSD than peers not exposed, however, they also detected PTSD symptoms in children who experienced indirect exposure (mainly via television). Duffy et al. (2015) find similar results for Northern Ireland (the Omagh car bombing in 1998). Schwarzwald et al. (1993) find higher stress responses among fifth-, seventh-, and tenth-grade Israeli children in areas hit by missiles during the 1990–1991 Persian Gulf War than among peers who had not been exposed to missiles, and that the responses were influenced by proximity to sites or individuals who had sustained actual damage. According to Hoven et al. (2003), New York City public schoolchildren (grades 4–12) exhibited higher than expected rates of PTSD six months after the September 11, 2001, terror attack in the city. Studies of the Israeli-Palestinian political conflict find an effect on adolescents' mental, behavioral, and emotional problems as well as PSTD, with a greater effect on children who live in more intense conflict zones (Dimitry, 2012, and Al-Krenawi, 2009). Schiff et al. (2007) find that in addition to PTSD, negative consequences of terrorism exposure among Israeli tenth- and eleventh-grade students included abuse of substances such as alcohol and cannabis. However, these studies are largely relies on self-reported retrospective data drawn from

[8]Buka et al. (2001); Mattarella-Micke and Beilock, 2012; Sauro et al., 2003

interviews of parents about the exposure of their children to these events or interviews of affected older children. Hence, these data may suffer from sample selection, systematic measurement error and problem of endogenous in the exposure to these events.

To overcome the limitation in the aforementioned literature, economic and sociological literature use administrative records and consider academic outcomes which are arguably more objective and easily observable. Several studies provide empirical evidence on the effect of large-scale violent events (e.g., civil wars) using data from countries such as Guatemala (Chamarbagwala and Morán, 2011), Cambodia (Merrouche, 2011), Peru (Leon, 2012), Rwanda (Akresh and Walque, 2008), and Tajikistan (Shemyanika, 2011). These studies consistently find that individuals exposed to such events experience worse educational outcomes. However, the types of events analyzed in these studies often disrupt many aspects of life, including economic and political systems, and destroy infrastructure. Hence, the affect on children's education is both by causing psychological distress and also by changing educational investment decisions, impairs school functioning, and schooling quality (Justino, 2011). In contrast, acts of terror in developed countries cause hardly any disruption to the functioning and quality of the education system and have virtually no effect on the individual's educational investment decision. In addition, none of these studies evaluate the effect of violent conflicts on the quality of schooling – usually measured by test scores – which is more significantly and directly related to measures of social and economic well-being (Hanushek and Woessmann, 2008).

There have been some recent studies on the effect of violent conflicts on test scores in Turkey (Kibris, 2015) and the Palestinian Authority (Bruck et al., 2014), and a related studies on the impact of drug-related conflicts in Mexico (Jarillo et al., 2016) and Brazil (Monteiro and Rocha, 2016). These studies use panel data with a measure of conflict intensity at the locality level for each year of the conflict. By controlling for school and year fixed effects, they identify negative causal effect on test scores. However, the generalizability of their findings to other contexts that are more relevant to developed countries, is not straightforward, especially since the settings analyzed in these studies have substantially high baseline levels of violence. In order to provide more generalize

findings, Gershenson and Tekin (2015) analyze the effect of a series of shootings events on students achievements in United States. Similar to the previous studies they find a negative effect on academic achievements. Nevertheless, a shortcoming of all these studies is that they all focus on how being exposed to violence during a few months or during the entire academic year affects students outcomes at the end of this period. Hence, they cannot isolate the exact mechanism for the negative impact they find, suggesting it can be both due to the impact on school resources (school closures, disruptions to routines, teaching quality, students and teachers absences) and the psychological impact.

Few studies examine the short-run effects of acute extreme violence on test scores in order to identify the stress effect (Poutvaara and Ropponen, 2010; Sharkey et al., 2014). The identification in these studies relies on the comparison between students who take the test before the incident and students who take the test after the incident. But treated students who choose to take the exam after a violent event could be different in their unobserved characteristics which also can have an effect on achievements.

3 Background

3.1 The Israeli-Palestinian Conflict and the Second Intifada

The Israeli-Palestinian conflict is one of the most enduring and politically explosive conflicts in the world. Despite a long-term peace process that began with the Oslo Accord in 1993 and Israel's general reconciliation with Egypt and Jordan, Israelis and Palestinians have failed to finalize a peace agreement.[9] The Israeli-Palestinian conflict began almost seventy years ago and is characterized by periods of low- and high-intensity violence. One of the most intense periods of violence was the Second Intifada (also called the "Al-Aqsa" Intifada), which began on September 29, 2000, after a period of relative calm that followed the Oslo Accord. On September 28, 2000, Ariel Sharon, the Likud Party candidate for the

[9]The Oslo Accord created the Palestinian National Authority, giving Palestinians their first-ever control over some civilian matters (e.g., education, health, and taxation) in both the West Bank and the Gaza Strip, which Israel had occupied since the 1967 Six-Day War. Even after Oslo, Israel maintained control over the strategic issues of security, foreign trade, and borders.

Israeli premiership, visited the Temple Mount, an area sacred to both Jews and Muslims, accompanied by more than 1,000 Israeli police officers. Although Israelis viewed the visit in an internal political context, Palestinians saw it as a provocation. The following day, a mass of unarmed Palestinian demonstrators and a large Israeli police contingent confronted each other at the Temple Mount, leaving four Palestinians dead and approximately twenty injured (Mitchell et al., 2001).

Although the violence began as a series of confrontations between Israeli security forces and Palestinian demonstrators, it quickly expanded to other violent actions and responses that lasted for several years. Suicide bombings, arguably the most important element of Second Intifada-related violence, resumed in late 2000, peaked in 2002, and subsided in 2005, claiming the lives of more than 1,000 Israelis (civilians and security forces). Concurrently, the Israeli Defense Forces (IDF) operated inside Palestinian cities: its military operations, offensives, and incursions resulted in more than 3,300 deaths among Palestinian civilians and militants.[10]

The IDF closed the borders between Israel and the West Bank and Gaza for days on end and used checkpoints to restrict the movement of goods and people within these territories (Cali and Miaari, 2013). While the intensity of the violence varied over time and across localities, the state of conflict persisted during the whole period. Many consider the relatively low levels of violence in late 2004 and, especially, in 2005, as marking the effective and unofficial end of the Second Intifada. Others regard the summit meeting in Sharm el-Sheikh on February 8, 2005, as the official end of the Second Intifada even though sporadic violence continued afterwards.[11] In the years since 2005, the number of attempted attacks has fluctuated but has not returned to 2004 levels. What is more, widespread suicide bombings ended.

During the Second Intifada, Israelis experienced over a hundred fatal terror attacks

[10]For a detailed description of the different periods of violence during the Second Intifada, see Jager and Paserman (2005).

[11]At this summit, Israeli Prime Minister Ariel Sharon, Palestinian Authority President Mahmoud Abbas, Egyptian President Hosni Mubarak, and King Abdullah II of Jordan gathered to declare their wish to work toward the end of the four-year Intifada. The summit resulted in Abbas' declaring that the violence would end and Sharon agreeing to release 900 Palestinian prisoners and withdraw from West Bank towns.

within the country's pre-1967 borders and more than 200 fatal terror attacks in the Israeli settlements in the West Bank (WB) and Gaza Strip (GS). More than 80 percent of the fatal terror incidents within Israel's pre-1967 borders were suicide bombings aimed almost exclusively at Israeli targets (Becker and Rubinstein, 2011). Most were in the largest and most densely populated cities (e.g., Jerusalem and Tel Aviv). Public buses were the most popular targets, accounting for one-third of all casualties, but coffee shops, restaurants, discos, and pubs were targeted as well.

3.2 The Israeli High-School Matriculation-Exam System

High school in Israel runs from tenth grade to twelfth grade. Students on an academic track are expected to obtain a matriculation certificate when they finish twelfth grade. In 2004, 91 percent of all Jewish high-school graduates took the matriculation exams and 63 percent earned certificates (Central Bureau of Statistics, 2006).[12] A matriculation certificate is a prerequisite for admission to academic post-secondary institutions and many employers require it as well. Students earn certification by passing a series of national exams in core and elective subjects during their high-school years, most of them in twelfth grade. Within subjects, students can choose the difficulty of the exam they take and credits are awarded accordingly: one credit for the least demanding exam through to five credits for the most difficult exam. It takes a minimum of twenty-one credits to qualify for a matriculation certificate. There are seven mandatory subjects that are tested at an aggregate level of at least sixteen credit units, and at least one elective subject at an advanced level that confers four or five credits.[13]

The examinations are given biannually during two periods: a winter season in January/February, in the mandatory subjects only, and a summer season in May/June, for all subjects. The Ministry of Education sets the dates of national matriculation exams well in advance. Students who are dissatisfied with their scores on a specific matriculation exam may retake the exam as long as they are still in high school. Since the 2001 school year,

[12]Excluding Arab and Ultra-Orthodox Jewish students.

[13]The seven core subjects are Mathematics, English, Hebrew (or Arabic for Arab students), History, Literature, Religious Studies, and Civics.

there has also been a special assessment period in July in which students may improve their scores in Math and English.[14] The exams are graded by two independent and anonymous examiners on a 1–100 scale, with a pass grade of 55. Examiners do not know the identity of the student or the school. For this reason and because each examiner grades exams from different schools in different regions, the probability of normalizing scores in response to observing a low score distribution in particular school or a region is very low. Only if the scores are relatively low nationwide does the Ministry of Education normalize scores across the board. Students can be tested in one exam questionnaire for the total credit units in a particular subject or may take more than one exam questionnaire in the subject, each questionnaire conferring a certain number of credits. In the latter case, the sum of the credit units on these exams is the total for the subject. Where students take more than one exam questionnaire on a given subject, they may do so on the same day or in different exam periods.[15]

The matriculation certificate specifies the final scores and total credit units in each subject; the final score is a simple average of the internal school score (also known as the protective score), based on the student's overall performance in this subject during the academic year, and the matriculation exam score.[16] Students are admitted to post-secondary programs on the basis of their average matriculation final scores and a psychometric examination (akin to the American SAT). Therefore, unusual stress and distraction caused by an act of terrorism shortly before a matriculation exam may have a long-term effect on the student's post-secondary schooling and labor-market outcomes. Students may choose to upgrade their matriculation certificate after finishing high school.

[14]Students can choose to be retested in the same subject at the same proficiency level or at a different proficiency level in subsequent examinations periods as long as they remain in high school. Until 2004, students who chose to retest in the same subject received the retest score. Since 2004, they can choose the higher score as long as the proficiency level is the same (Ministry of Education document, March 10, 2004, in Hebrew).

[15]It is usually the school's decision how to spread the exams among the high-school years.

[16]In most high schools, the internal school score is the weighted average of a final year exam (usually 30 percent as recommended by the Ministry of Education) and the average scores in all tests in this subject during the academic year (usually 70 percent as recommended by the Ministry of Education). The final year exam is an internal school exam that precedes the matriculation exam by one to three weeks and has the same format as the nationally administered matriculation exam, except that it is graded by the student's school subject teacher.

Indeed, one-quarter of 2002 matriculation examinees who were unsuccessful at graduation completed their certificate requirements by 2010 (Central Bureau of Statistics press release, 2011). However, obtaining or upgrading certification after graduation is usually a costly process that postpones one's access to post-secondary schooling and delays entry to the labor market.[17]

4 Data

4.1 The Terror Data

The data on terror used in this study comprise a daily record of terror incidents with at least one Israeli fatality within Israel between January 2001, shortly after the beginning of the Second Intifada, and the end of 2005, when terror attacks within Israel had mostly subsided.[18] The main source of this data is B'Tselem, the Israeli Information Center for Human Rights in the Occupied Territories, crosschecked with the Israel Ministry of Foreign Affairs website.[19] The database contains information on all Israeli civilian and security-forces fatalities from terror attacks and is itemized by date and location of the fatal incident. In this dataset, terror attacks that took place within Israel's borders (excluding the Israeli settlements in the WB and GS) fit the definition of terror attacks as premeditated, politically motivated violence perpetrated against noncombatant targets. The term 'noncombatant' is construed as including, in addition to civilians, military personnel who were unarmed and/or not on duty at the time of the incident.[20]

Figure 1 shows the timing and the total number of Israeli fatalities in each terror attack

[17]Israelis begin a period of military service (normally three years for males and two for females) after high-school graduation. Thus, retaking a matriculation exam is possible only several years after the relevant coursework was done. Hence, students who wish to be re-tested after high-school graduation usually take preparation courses that require investments of money and time.

[18]Since the Second Intifada began in late September 2000 whereas the matriculation exams took place in January, May, June, and July, the data do not include the last three months of 2000 (October–December).

[19]The B'Tselem data are thought to be accurate and reliable and have been used by other researchers (e.g., Jaeger and Paserman, 2008; Gould and Klor, 2010; Zussman 2014).

[20]The definition of terror attacks used here is the definition of "terrorism" contained in Title 22 of the United States Code, Section 2656f(d): "The term terrorism means premeditated, politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents, usually intended to influence an audience."

included in the data. The figure clearly shows large variation in the incidence and severity of daily attacks. Figure 2 presents the total number of fatalities among civilians and security forces in each month during the sample period. Table 1 itemizes these fatalities by district and year and shows the total number of terror incidents with at least one fatality by district and year. As Table 1 demonstrates, the number of Israeli fatalities was characterized not only by temporal variation but also by geographical variation. During the period under investigation, the number of fatalities within Israel was 628 (85 percent of them civilian), resulting from 130 separate attacks that claimed at least one fatality. The number of fatalities and incidents peaked in 2002 and was especially high in the Jerusalem District. The analysis presented in this study excludes the Israeli settlements in the WB and GS because they may be outliers:[21] compared to those living within Israel's pre-1967 borders, settlers experienced a much higher level of politically motivated violence, and a different type of terrorism, during this period.[22]

The Israel Central Bureau of Statistics (CBS) divides Israel (excluding the WB and GS) into six districts and fifteen sub-districts. Each sub-district is divided into natural geographic areas, which I use to sort the data. According to the CBS definition, a natural geographic area (hereafter 'area') is as continuous and uniform as possible in terms of physical structure, climate, and soil, and in terms of the demographic, economic, and cultural traits of its population. Figure 3 and Table A1 in the Appendix depict the total number of fatalities across areas throughout the sample period. Figure 3 and Table A1 in the Appendix show that terror factions targeted the most populated areas of the country (Jerusalem, Tel Aviv, and Haifa) and areas that are close to particularly radical cities under the control of the Palestinian Authority (e.g., Jenin).

[21] In Table 9, I include the WB and GP in the analysis as a robustness check.

[22] During the sample period, 415 Israelis were killed in the Occupied Territories in 217 separate attacks. More than half of the fatalities were armed and/or on duty with the security forces. Most incidents that claimed civilian fatalities involved gunfires, stone throwing, kidnapping, and murders (B'Tselem).

4.2 The Educational Data

The educational database contains administrative records of all high-school students collected by the Israeli Ministry of Education for 2001–2005 (coinciding with the terror data). This dataset includes both matriculation test scores data and rich demographic information on students. The test-scores dataset covers each student who took a matriculation exam in any subject, offering observations for students' performance on each exam questionnaire on different dates and across the full range of subjects. For each exam questionnaire, I observe the exam score, the student's internal school score, the number of credit units earned on each exam, and the date and time of the exam.[23] The matriculation exam scores use a 1-to-100 scale that I have converted into z-scores by exam questionnaire and examination period. For each student, which I observe in the test-scores data I know whether the student received a matriculation certificate at the end of high school, the total credit units awarded in the certificate (including the total in each subject), and the average matriculation final score. Demographic information includes the student's gender, parents' education level, number of siblings, country of origin, ethnicity, and identification of high school and locality.

The sample is limited to twelfth-grade students who attended schools in the regular Jewish State system.[24] I observe only twelfth-graders for several reasons. First, most matriculation exams are given in twelfth grade. Second, observing students in different years may create selection in the sample since students might have changed schools due to the effect of the Second Intifada. However, the probability of switching schools during twelfth grade, particularly during the matriculation examination period, which is only several months long, is approximately zero.[25] Third, terror may have different effects on

[23]Note that the credit units awarded to a student for a particular exam in a particular subject are not necessarily equal to the total credit units that the student receives in the subject. Students may take more than one exam in the same subject (on the same day or in different exam periods), while the sum of the credit units in all exams on the same subject is the total credit unit in the subject.

[24]Students from Arab schools are excluded because Palestinian terror attacks may affect the Arab population of Israel differently to the Jewish population, which is the target of these attacks (although the Second Intifada caused deaths and injuries among Arab citizens as well). Regional schools are also excluded because many students who attend them live in different geographical locations and may be affected by terror in both their home region and their school region.

[25]In my sample, only eight students out of almost 250,000 switched schools during twelfth grade.

students of different ages. Twelfth-grade students, being the oldest cohort among the high-school population and the one closest to military service, would probably be more affected than younger students. The effect of terror during the Second Intifada may also vary over time (for example, if people tend to adapt to the situation). Academic performance, however, may also correlate with age and time, so it is challenging to eliminate these two effects among students.

It is possible to establish the intensity of local terror-related violence in the days before an exam using information on the dates of matriculation exams and students' location.[26]An exam is defined as exposed if a fatal terror attack with at least one fatality occurred in a five-day window preceding the exam in the examinee's area. The number of the Israeli fatalities from the terror attacks in a five-day window before the exam measures the exposure intensity.[27] Table 2 presents the distribution of exposure intensity over the sample period (2001-2005) both at the exam and the student level data. Although terror attacks during the sample period are not rare, a very small proportion of the matriculation examinations were terror related. Only 31,312 of 1,949,198 (1.6 percent) matriculation examinations were exposed to terror attack. These exams were taken by 20,687 students out of a total number of 254,059 (8.35 percent). These students were defined as exposed students.

The summary statistics for my sample are presented in Table 3 in two panels; exam-level data (panel A) and student-level data (panel B). The sample is composed of 1,949,198 matriculation examinations taken by 254,059 students at 421 schools in thirty-seven areas throughout Israel between 2001 and 2005.[28] Column 1 presents the means and standard deviations for the whole sample. According to panel A, the average score for the matriculation exams is 72.3 and the average internal school score is 78.5. The average

[26]The information on students' locality of residence is limited because small settlements are unidentified. Thus, I assign examinees to geographical locations through the proxy of school location. For students who have an identified locality, only 5 percent live outside the region of their school. However, as a robustness check, in Table 9 I excluded students who live in geographical location other than their schools.

[27]The definition of exposure to terror is fully detailed in Sections 5 and 6.1.

[28]There are fifty-two natural areas in Israel but this sample contains just thirty-seven areas because it is limited to students who attend regular State high schools in the Jewish system. The fifteen natural areas that the sample omits have either only Arab schools or no regular State schools because of an especially sparse population.

number of credit units per matriculation exam is 1.76. Only 6.5 percent of examinees retake tests and 15.2 percent fail the exam. In a given matriculation examination period, students have an average of 7.5 days between exams. According to panel B, 75 percent of the students earned their matriculation certificate with an average matriculation composite score of 77.2 and an average of 24.6 credit units.[29] During high-school years, students take thirteen matriculation exams on average, most of them (8 out of 13) in twelfth grade.

In columns 2 and 3 of Table 3 I stratify the sample by student exposure status. Column 2 in panels A and B reports the summary statistics on all exams (not only the exposed exams) outcomes and on matriculation outcomes and background characteristics of the exposed students, respectively. Column 3 reports the same for the unexposed students. The difference between these two columns and its t-statistics are reported in column 4. Students that were exposed to terror attacks during examination period have better exams and matriculation outcomes. Columns 2-4 show that the exposed and unexposed students are different in many other dimensions apart from their exposure to terror. For instance, students exposed to terror were tested in more exams and in exams of higher difficulty level. In addition, their parents are more educated. The fact that exposed students are higher-achieving students and have better background characteristics can be explained by two reasons: first, students exposed to terror are from specific areas in Israel (as reflected in Table 1 and Figure 3), usually large cities (such as Jerusalem and Tel Aviv) which are composed of relatively high socioeconomic population. Second, since higher-achieving students take more demanding matriculation programs that include more credit units and hence more exams, they have a higher probability of experiencing a terror attack before an exam. In columns 5 and 6 in panel A I stratify the sample of the exposed students by exposure status of their exams. The difference between these two columns and its t-statistics are reported in column 7. As it shows, students perform poorly on the terror-related exams. Hence, in my empirical analysis, I explore the variations in exam scores within these students.

[29]The sample does not include twelfth graders who took none of the matriculation exams.

5 Empirical Strategy

My empirical strategy relies on temporal and geographical variation in the frequency and intensity of terror attacks during the Second Intifada within Israel, and on the panel structure of the test-score data due to the repeated nature of the Israeli matriculation exams. Possessing data on the exact time (hour and date) of each matriculation exam and being able to link it with data on daily terror incidents at the examinee's location (area), I can control for time and area fixed effects. Better still, I can control for student fixed effects because I observe the students as they take multiple exams. Hence, the basic empirical strategy is to regress the students' test score (transformed into z-scores by exam and date) on a particular matriculation exam on a measure of the terror intensity in the student's area during an n-day window preceding the exam (including the day of the exam but before the exam starts) according to the following specification:

$$y_{irsqt} = \beta \sum_{j=0}^{n} Fatalities_{ir,t-j} + \tau_t + \delta X_i + \lambda Z_{iqt} + \gamma_i + u_{irsqt} \tag{1}$$

where y_{irstq} is the standardized test score of student i in area r from school s on the matriculation exam q on day t. $Fatalities_{ir,t-j}$ is the number of Israeli fatalities from terror attacks in area r of student i on day $t-j$. When no terror attack (or a terror attack without fatalities) occurs in area r on day $t-j$, $Fatalities_{irs,t-j}$ is equal to zero. If $n = 1$, then β measures the immediate effect on scholastic performance of the intensity of terror on the same day of the exam or the day preceding. If $n = 5$, then β measures the effect of terror intensity on the exam day or during the five days preceding. τ_t is the year and examination period fixed-effect controlling for test-score time trends. X_i is a vector of observable student characteristics including parents' years of education, number of siblings, a gender indicator, a dummy for born in Israel, and a set of indicators for ethnicity. Z_{iqt} is a vector of exogenous explanatory variables related to the exam, including a fixed effect for proficiency level (i.e., the number of credit units earned by passing the exam and total credit units in the subject of the exam), an indicator for exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, and an indicator

for a retake exam. γ_i is a fixed effect for the student and u_{irsqt} is an error term clustered at the school level. Note that in different specifications I will use area or school fixed effects in place of students fixed effects, and in specifications with students fixed effects my students' controls are obviously dropped.

A critical assumption for the inference of a causal effect of β is that unobserved determinants of students' test scores are uncorrelated with the variation of terror-attack intensity. Insofar as terror attacks are concentrated in certain areas (as discussed in the previous section), a spurious correlation between attacks and students' achievements may exist if these same localities are also different from the rest of the country in terms of their students' achievements. The structure of my data allows me to use area or school fixed effect to control for time-invariant features of area or school. However, another possible concern is if unobserved features of the student are correlated with terror attacks. For example, if the occurrence of a terror attack shortly before the exam causes certain students not to take the test, especially in the winter examination period or in subjects that allow re-testing in the special assessment period during the summer, it would create selection among students who take the exam. Another potential problem is that higher-achieving students take more demanding matriculation programs that include more credit units and hence more exams. These students have a higher probability of experiencing a terror attack before an exam because they take more exams. The inclusion of student fixed effects overcomes these potential biases.

It is important to note that the frequency and severity of terror attacks were relatively high throughout the sample period, especially in certain areas, as described in Section 4. Although it is interesting assess how a sustained conflict affects academic performance, the objective here is to analyze how an unexpected terror attack shortly before an exam affects students' performance on the exam, when the sole channel of this effect is an increase in stress and distraction from learning. Therefore, my within-student estimator eliminates the effect of a sustained terrorist conflict and captures idiosyncratic shocks from terror attacks shortly before an exam. For example, if a sustained terrorist conflict is associated with declines in teaching quality and students' learning due to sustained stress,

my within-student estimator eliminates these effects.

In this setting, I assume the existence of one potential connection between terror and my main outcome variable, the exam scores. Terror may directly affect student learning and performance on tests via stress and psychological impacts. Becker and Rubinstein (2011), studying Israelis' reactions to terror incidents during the Second Intifada, find that stress and fear generated by terror attacks affect consumption behavior primarily and most significantly during the week following the attack. I assume that the reaction of Israeli high-school students follows the same pattern. If a terror attack shortly before an exam in the examinees area reduces a student's score with all other confounding factors controlled for, then the channel must be through the effect of stress. This is consistent with the findings in the psychological literature showing that rates of 'substantial stress' among the general population following terrorist events are extremely high in the first few days after the incident but are already in decline in the first 2 weeks, and the proportion of people experiencing substantial stress was negatively associated with distance from the attacks (Whalley and Brewin, 2007). In addition, while media coverage of the terror attack may distract the student before the exam, it cannot be separated from the effect of stress because exposure to media coverage of a tragedy has been shown to generate symptoms of anxiety and distress (Slone, 2000; Schlenger et al., 2002; Saylor et al., 2003; Becker-Blease et al., 2008; Holman et al., 2014).[30]

6 Results

6.1 The Time Window for the Effect of Terror on Test Scores

In my baseline specification (equation 1), the main parameter of interest β measures the marginal effect of an additional Israeli fatality from a terror attack in the student's area within an n-day window preceding the exam on student performance at the exam. To identify the specific timing of the impact (n), I initially estimate the model by allowing

[30]Media coverage makes the extreme consequences of terrorism and other trauma-related news more tangible by bringing the events into people's homes and publicizing their effects. In this manner, such coverage appears to generate anxiety and distress.

for an immediate effect on the test score on the same day of the attack (but before the exam started) and allowing for a lagged effect for up to fifteen days after the attack, as in the following specification:

$$y_{irsqt} = \sum_{j=0}^{15} \beta_j Fatalities_{ir,t-j} + \tau_t + \delta X_i + \lambda Z_{iqt} + \gamma_i + u_{irsqt} \quad (2)$$

Figure 4 presents the results of this model with student fixed effects (Table A2 in the Appendix reports the results of this model with area, school, and student fixed effects in columns 1, 2, and 3, respectively). The figure shows the estimated coefficient of each β_j in equation (2) with a 90 percent confidence interval. As shown in the figure, the effect of terror is most negative and significant when the attack occurs in the student's area on the exam day (but before the exam begins), while each additional Israeli fatality lowers the student's test score by 0.019 standard deviation (S.E.=0.010). The marginal effect of each additional fatality from a terror attack that occurs one day before the exam is -0.014 standard deviation (S.E.=0.012), although it is non-significant. The effect of a terror attack two, four, or five days before the exam is also negative and statistically not significant but smaller. The marginal effect of an additional Israeli fatality from a terror attack two, four, or five days before the exam is -0.006, -0.007 and -0.009 standard deviation respectively. The marginal effect reverts to non-significance but remains negative on the sixth and seventh days. On the eighth and tenth days, the effect is positive and significant; on the ninth day, it is negative and statistically significant.

These noisy estimated effects probably occur because the explanatory variables in equation (2) are counted at the daily level and because cases with positive values are very rare. Therefore, I also estimate a specification that collapses every two days into a two-day

window, as follows:

$$
\begin{aligned}
y_{irsqt} = {} & \beta_1 \sum_{j=0}^{1} Fatalities_{ir,t-j} + \beta_2 \sum_{j=2}^{3} Fatalities_{ir,t-j} + \beta_3 \sum_{j=4}^{5} Fatalities_{ir,t-j} \\
& + \beta_4 \sum_{j=6}^{7} Fatalities_{ir,t-j} + \beta_5 \sum_{j=8}^{9} Fatalities_{ir,t-j} + \beta_6 \sum_{j=10}^{11} Fatalities_{ir,t-j} \\
& + \beta_7 \sum_{j=12}^{13} Fatalities_{ir,t-j} + \beta_8 \sum_{j=14}^{15} Fatalities_{ir,t-j} \\
& + \tau_t + \delta X_i + \lambda Z_{iqt} + \gamma_i + u_{irsqt}
\end{aligned} \tag{3}
$$

Figure 5 displays the results of this model with student fixed effects (Table A2 in the Appendix reports the results of this model with area, school, and student fixed effects in columns 4, 5, and 6, respectively). The figure shows clearly that a terror attack within a five-day window preceding the exam has a significant effect on the test score and a terror attack six days or more before the exam has no effect. I do not reject the null hypothesis that the coefficients for the immediate effect (day of exam and day before), the second- and third-day effect, and the fourth- and fifth-day effect are statistically equal (The p-value for the null hypothesis that $\beta_1 = \beta_2 = \beta_3$ in equation 3 is 0.328). I do, however, reject the null hypothesis for the statistical equality of all eight coefficients of in equation (3) (p-value=0.038 for the null hypothesis that $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8$). Overall, the point estimates and the p-values suggest that a terror attack up to five days before the exam will have an effect. Therefore, in the rest of this paper, I focus only on this window. Another important implication is that the effect of terror on test scores, in my setting, is transitory and not persistent. For an additional analysis that reinforces this statement, see section 7.1.

6.2 The Effect of Terror on Test Scores

Table 4 presents the results for β in my baseline specification, equation (1), for $n = 5$ (following the results in the previous section). Column 1 reports the correlation between the exam score and the number of fatalities from a terror attack in the five days preceding

the exam using OLS without area, school or student fixed effects. It shows that the marginal effect of each additional fatality from a terror attack is very small and not statistically different from zero (coefficient -0.0006, S.E.=0.0023). The results also indicate that the number of fatalities in a terror attack shortly before the exam does not explain the variation in test scores (R-squared = 0.000), as one would expect. In column 2 I add time fixed effects and controls for student characteristics including parents' education, number of siblings, gender dummy, an indicator for being born in Israel, and a set of indicators for ethnicity. The coefficient is more negative but statistically insignificant (-0.003, S.E.=0.002). In column 3 I also include area fixed effects to account for a potential correlation between terror attacks and time-invariant features of a particular location. As expected, this makes the estimated coefficients more negative and statistically significant, with a marginal effect of -0.005 standard deviation (S.E.=0.001). Column 4 presents the estimated coefficient of a specification that includes school fixed effects instead of area fixed effects, capturing time-invariant features at both the area level and the school level. The results are similar to those reported in column 3.

To control for student ability and other time-invariant factors at the student level, in column 5 I present my within-students estimate by including only time fixed effects and student fixed effects in the specification. This increases the negative marginal effect to -0.008 standard deviation (S.E.=0.002). However, variables relating to specific exams or subjects that correlate with the effect of terror attacks may be omitted.[31] In column 6, in addition to the time and student fixed effects, I add a set of objective exam controls including fixed effects for the proficiency level of the exam (at the subject level), an indicator for the exam subject category (science, humanities and vocational), an indicator for selective or mandatory subject, and an indicator for a retake exam. These controls may account for unobserved heterogeneity effects of the different types of exams (which

[31] A possible explanation for this is that in different subjects and at different proficiency levels the same student may react differently to the effect of a terror attack before the exam. For example, if the exam is in a subject for which the student does little preparation, a terror attack a few days before the exam would not affect learning and hence would not affect his or her performance on the exam even if it creates stress in the short term. Another possible explanation is a positive correlation between the probability to terror attack and the difficulty of the exam because there are more exams per student as the proficiency level of the subject rises.

may correlate with the way a terror attack affects students' performance). The estimate presented in column 6 is my preferred estimate which indicates that an increase of one fatality from a terror attack in the student's area within five days before the exam is associated with a decline of 0.0066 standard deviation (S.E.=0.002) in the student's test score on the exam.

Given that some areas experienced several high-intensity attacks during the sample period, a terror attack with twenty-six fatalities—the largest number of fatalities within any five-day window before a matriculation exam in my sample—reduces test scores by 0.182 standard deviation relative to exams taken with no terror fatalities in the preceding five-day window. Unfortunately, there were five attacks with more than twenty fatalities during the Second Intifada and even more attacks with ten fatalities or more within Israeli borders (not including WB and GS). This effect is larger than the effect found by Ebenstian et al. (2016) of elevated pollution levels on exam day on students' exam performance (a decline of roughly 0.13 standard deviation in scores).

6.3 Heterogeneity Effects

Table 5 examines heterogeneity in the effect of terror by students' characteristics. I split the data by student gender, religious orientation (secular or religious), and parents' education as a proxy for student ability and socioeconomic status.[32] Table 5 reports the results from estimations of equation (1) for each of the above subsamples including exam controls and time and student fixed effects. P-values for coefficient equality within each group are reported as well. Columns 1 and 2, presenting the results when the sample is stratified by gender, show a larger absolute coefficient for girls. Columns 3 and 4 stratify the sample by the religious orientation of the student's high school. The effect of terror on test scores is slightly larger among secular students. Columns 5 and 6 stratify the sample by parents' education, with high education meaning that the sum of both parents' years

[32]I do not use the internal school score as a measure of student ability and invoke it to stratify the sample for two main reasons. First, this score may be endogenous, as I explain further. Second, it is on a 0–100 scale and takes no account of the proficiency level of the subject on which it is given. Thus, students who take low-proficiency matriculation exams may have high internal school scores and vice versa, even though the latter are more able.

of schooling exceeds twenty-four (the median value in the sample). The estimated effect is larger among students who have less educated parents. However, given that none of the estimated differences is statistically significant, the results in Table 5 suggest that there is no heterogeneity in the immediate effect of terror on test performance.

6.4 Non-Linear Effect of Terror on Test Score

In my main specification I assume the effect of terror fatalities on test scores to be linear. Nonlinear effects are also worth exploring. In particular, I test whether terror impacts vary with intensity. In Table 6, I replace my count-of-fatalities variable with a dummy variable that indicates whether a terror attack occurred in the examinee's area shortly before the exam. First I make the dummy variable equal 1 for any terror attack with at least one Israeli fatality. In the second alternative, I make the dummy variable equal 1 for a terror attack with more than five Israeli fatalities, and in the third alternative I make the dummy variable equal 1 for a terror attack that causes more than ten Israeli fatalities.

Columns 1, 5 and 9 report the estimated effect on the exam score of any terror attack with at least one Israeli fatality in the student's area within a five-day window preceding the exam with area, school, and student fixed effects, respectively. In my preferred specification with student fixed effects the coefficients is negative and significant, indicates that any fatal terror attack in the student's area within a five-day window preceding the exam reduce test score by 0.033 standard deviations (S.E.=0.017). Columns 2, 6 and 10 report the estimated effect on the exam score of any terror attack with more than five Israeli fatalities in the student's area in a five-day window preceding the exam. The coefficients are about three times larger in absolute terms than those in columns 1, 5 and 9 and are statistically significant for all specifications (area, school, and student fixed effects). This indicates that a terror attack with at least six Israeli fatalities in the student's area reduces his or her test score by 0.118 standard deviations (S.E.=0.031) in a specification that includes student fixed effects (column 6). Columns 3, 7 and 11 report the estimated effect on the exam score of a large terror attack (more than ten Israeli fatalities) in the student's area in the five-day window preceding the exam. The coefficient in my preferred specification

(column 11), which includes student fixed effects, showing that a large terror attack with at least eleven fatalities in the student's area shortly before the exam reduces his or her test score by 0.129 standard deviations (S.E.=0.036). This is a large and significant effect.

In columns 4, 8 and 12 I estimate a specification including three dummy variables: (i) an indicator for a terror attack with at least one fatality but fewer than six, (ii) an indicator for a terror attack with at least six fatalities but fewer than eleven, and (iii) indicator for a terror attack with more than ten fatalities. The results show that "high-intensity terror" rather than "some terror" is responsible for the previously estimated effects. While terror attacks with one to five fatalities have no effect on student's test score (a positive and insignificant coefficient), attacks with at least six fatalities have negative effects on test scores. Overall, the results in Table 6 suggest that my main results are driven by large terror attacks with more than five fatalities.

7 Threats to the Identification Strategy

7.1 Timing (Placebo Test)

My main results suggest that fatalities from a terror attack in the student's area in a five-day window preceding the exam reduce exam scores. However, this identification strategy may be threatened if I also find a correlation between exam scores and fatalities from a terror attack in any other five-day window. To overcome this potential concern, I perform two tests. First, I look for a relation between other five-day windows before the exam and the exam score. To do this, I define two additional variables. The first is the number of fatalities in the student's area in the ten days preceding the exam not including the most recent five days before and the second is the number of fatalities in the student's area in the fifteen days preceding the exam not including the most recent ten days before. Columns 1, 4, and 7 in Table 7 present the estimated effects from specifications including these two additional variables and the main variable of interest (fatalities in a five-day window preceding the exam) with area, school, and student fixed effects, respectively. The other columns report the estimated effect of each of these two additional variables when I

include them separately in the specification. All specifications include time fixed effects and exam controls. Specifications with area or school fixed effects include students controls as well. The estimates in Table 7 show that the number of fatalities in the student's area in the fifteen days preceding the exam, not including the most recent five days, has no effect on the student's performance on the exam.

This suggests that the only relevant timing of terror events is the five-day window before the exam and that the effect is not persistent. This result consistent with psychological studies on the stress reactions following terror attacks (Whalley and Brewin, 2007) which strengthen the assumption that stress is an impotent mechanism in the observed effect of terrorism on academic performance. Related studies on the effect of terrorism on other outcomes related to individual behavior show the same pattern. For example, Becker and Rubinstein (2011) show that terrorism in Israel effect on the consumption of goods and services subject to terror attacks (e.g. bus services, coffee shops) while the most significant effect is during the first week after the attack. Stecklov and Goldstein (2004) show that traffic volume on the roads in Israel declines for 2-3 days following an attack, with traffic fatalities increasing on the third day after the attack. Gould and Stecklov (2009) find that terror attacks reduce crime (except trespassing and "disrupting the police") in the five days after the attack. The authors conclude that the mechanism that generates their results is not only the increased police presence after a terror attack but also the tendency for individuals to stay home after a terror attack.

The second test is a natural placebo test in which the outcome variable is regressed on future rather than past fatalities from terror attacks. In columns 1, 3, and 5 in Table 8, I re-estimate equation (1) including area, school, and student fixed effects, respectively, with an additional fatalities variable: the number of fatalities in the student's area during the five days following the exam.[33] Columns 2, 4, and 6 report the estimates from specifications that include only future fatalities with area, school, and student fixed effects, respectively. Aside from my benchmark measure of the five-day window before the exam, the results are not statistically different from zero, showing that future fatalities are not significantly

[33]It includes fatalities from terror attacks that occurred on the day of the exam. Those occurring after the exams started are considered fatalities of terror attacks on the day after the exam.

associated with test scores. The lack of a significant effect within the alternative time windows of both Table 7 and Table 8 provides reassurance that my main results are not driven by a spurious correlation.

I conduct yet another analysis by adding to equation (3) the effect of future fatalities in a two day window for up to ten days following the exam. The estimated coefficients for both the lag and the lead effects of terror fatalities from specification include exam controls, time and student fixed effects, and appear in Figure 6. The estimated coefficients for the effect of future fatalities on test scores are very noisy and not statistically significant with one exception: fatalities from a terror attack on the sixth or seventh day after the exam are positively associated with test scores. However, the estimated coefficients of the effect of past fatalities on test scores are more consistent, showing a negative and significant effect for up to five days before the exam. This supports my previous finding in Table 8 that there is no reverse causality, i.e., that future fatalities do not affect test scores. It also supports the claim that the effect of terror identified is a transitory one, driven primarily by terror attacks in a five-day window before the exam.

7.2 Alternative Identification Strategy

My estimate of β in equation (1) could be biased by the omission of variables that correlate with the probability of a terror attack just before an exam and exam outcomes. For example, if terror attacks occur more often before more difficult exams than otherwise, this may be the reason for the negative estimated effect. It is very unlikely that terrorists plan attacks according to the difficulty level or the subject of the national matriculation exam. Moreover, the Ministry of Education schedules exams long in advance and never reschedules them due to a terror attack (Ministry of Education data). However, a spurious correlation between the two is possible. Since there are more exams per student as the proficiency level of the subject rises, the frequency of difficult exams is higher. Therefore, the probability of a terror attack prior to more difficult exams is higher. Indeed, 40 percent of examinees who experienced terror attacks within a five-day window before an exam were being examined at the highest proficiency level (i.e., in subjects that award five credit

units).[34]

To explore this potential correlation, I use an alternative identification strategy and test variation within exams instead of within students. Since all exams in the same subject take place on the same day and at the same time in all areas, the temporal and geographical variation in terror attacks allows me to compare scores on exams at the same subject and the same difficult level for examinees who live in areas that saw terror attacks in the five days preceding the exam and examinees from areas that experienced no attacks during that time.[35] Hence I re-estimate equation (1) without exam controls and replace the student fixed effects with subject-by-level fixed effects.[36]

Table 9 presents the results. The results in columns 1 and 3, derived from specifications with area and school fixed effects respectively, show a similar marginal effect of an additional fatality from a terror attack in the examinee's area in the five-day window before the exam as in the main analysis. To control for heterogeneity in the examinee's ability that is not captured by the student characteristics, I include in columns 2 and 4 the student's internal school score for the particular exam. Including the internal school score reduced the estimated effect. The internal school score, however, may be endogenous and biased for several reasons. First, it is includes a coursework component for the school year, and an end-of- year exam that may also be affected by stress due to terror in the area during the year. Second, as a non-blind score given by the student's own teacher, it may be affected by factors extraneous to the student's ability, such as stereotyping and discrimination (Lavy, 2008).[37]

The subject-by-level fixed effects strategy generates results which are consistent with those from the student-fixed-effects strategy, although the effect is slightly smaller. This

[34]About 26 percent were being examined at a proficiency level of two credit units, 12 percent were being examined at proficiency level of three or four credit units and 8 percent were being examined at proficiency level of one credit unit.

[35]Note that exams at the same subject and the same difficult level are not the same questionnaires. There is a multiple questionnaires in each subject and difficult level. Since test score are converted into z-score by exam questionnaire and date there is no point to use questionnaire fixed effects.

[36]It is not possible to include both student fixed effects and subject-by-level fixed effects in the same specification because there is no variation in exams and subject by level within individual students.

[37]Although the internal-school score may be better in explaining the variation in test scores, the analysis in this study is meant to identify causal effects and not predict test scores.

suggests that the results of my main analysis, in my preferred specification with student fixed effects and exam controls, are robust and probably do not suffer from omitted variables related to specific exam characteristics which are not captured by the exam controls. Note that including the student's internal school score increases the estimated coefficient, i.e., moves it slightly toward zero. This, however, may be due to a bias resulting from the inclusion of an endogenous variable in the regression.

7.3 Distance

The parameter of interest in my analysis is β in equation (1), which represents the causal effect of the intensity of local terror activity on student's test score. A main assumption in this analysis is that students are "sensitive" only to terror fatalities in their area of residence. To explore the role of geographical distance, I expand equation (1) by adding three variables: (i) the number of terror fatalities in the student's sub-district but outside his or her area; (ii) the number of terror fatalities in the student's district but outside his or her sub-district; and (iii) the number of terror fatalities in Israel but outside the student's district - all of which in the five days preceding the exam.

Table 10 reports the results. In columns 1, 4 and 7, the specification includes fatalities in the rest of the sub-district and the district, in addition to those in the student's own area. The other columns add fatalities in the rest of the country and columns 3, 6 and 9 also include Israeli civilian fatalities in the WB and GS in the variable that counts the number of terror fatalities in the rest of Israel. P-values for the equality of the various coefficients are reported as well. The results in Table 10 show that the effect of terror fatalities on test scores decreases with distance. In my preferred specification with student fixed effects (columns 7-9), none of the coefficients for fatalities in the student's sub-district or district but outside his or her area are statistically significant. The effect of fatalities in the rest of the country (excluding and including the WB and GS), but outside the student's district, is negative and statistically different from zero but significantly smaller than the effect of fatalities sustained in the student's area.

These results are consistent with other studies showing that stressful responses are

likely to decay with physical distance from the site of an attack.[38] Although everyone is aware of terrorism through the media, exposure to news about terror attacks and fatalities through friends, neighbors, and schoolmates is likely to amplify fear of terrorism considerably. Therefore, the results suggest that physical distance mitigates the effect of terror on academic achievements. Moreover, accounting for potential effects from other areas is immaterial to the main analysis results (the estimates in row 1 resemble those in Table 4).

7.4 Robustness of the Results for Sample Selection

In this section I test whether my results are sensitive to the sample that I choose for the baseline analysis. The results are in Table 11. In columns 1-3, students who live in one area and attend a school in a different area are excluded from the sample. Although these students account for only 5 percent of the sample, they may be affected by terror attacks in their area of residence as well as those in the area of their school. Excluding them from the analysis, however, does not change the results compared to my main analysis (Table 4). In columns 4–6 the explanatory variable, fatalities, is measured in terms of civilian fatalities only, instead of total fatalities. The reaction of Jewish Israeli high-school students to fatalities among the security forces may differ from their reaction to civilian fatalities because they may perceive the latter as illegitimate targets of politically motivated violence. Conversely, the presumed military enlistment of the twelfth graders in my sample in the following year may also have some influence on their reaction to fatalities among members of the security forces. Again, however, the estimates are the same as in Table 4. In columns 7–9, I include in the analysis students residing in Jewish settlements in the WB and GS and find that inserting this set of observations into the regressions has almost no effect on the size and statistical significance of the coefficient of interest. Overall, the results in

[38]Schuster et al. (2001) show that the fraction of adults reporting substantial stress 3–5 days after September 11 was 61 percent among those within 100 miles of the World Trade Center (WTC), 48 percent among those within 101–1000 miles of WTC, and 36 percent among those more than 1,000 miles from WTC. Smith et al. (1999) find that three to four months after the Oklahoma City attack, 43 percent of individuals living in Oklahoma City reported four or more stress symptoms, as against 11 percent of individuals living in Indianapolis.

Table 11 suggest that my main analysis results are robust and not sensitive to the sample that I choose.

8 The Effect of Terror on Matriculation Outcomes with Long-Term Implications

My analysis focuses on the short-term effect of terror on test scores. Terror, however, may also affect long-term human capital outcomes. Failure on a matriculation exam may lead to high-school graduation without a matriculation certificate, which has meaningful implications for post-secondary schooling and access to the Israeli job market. Furthermore, success on matriculation exams facilitates university admission and access to more desirable college majors. To evaluate the potential harmful long-term effect of terror on human-capital formation in this context, I examine the effect of terror on the probability of passing the exam, the probability of obtaining a matriculation certificate, and the quality of the certificate earned (measured by the composite score).

In Table 12, I use my baseline specification (equation 1) to evaluate the effect of a terror event in the student,s area in a five-day window preceding the exam on the probability of passing the exam. I test both the linear effect of terror fatalities (panel A) and the effect of large terror attacks that claim more than six fatalities (panel B). The results show that an additional terror fatality in the student's area in the five days preceding the exam reduces the probability of passing the exam by 0.2 (S.E.=0.0004) percentage points. They also show a large decline in a student's probability of passing the exam after a large terror attack. Thus, according to my preferred specification with student fixed effects (column 3), a terror attack with more than five fatalities reduces the probability of passing the exam by 1.9 (S.E.=0.007) percentage points. For comparison, Lavy et al. (2014) find that testing on a very polluted day relative to a normal day reduces the probability of passing the exam by 2.4 and 12.3 percentage points when the pollution is measured in terms of particulate matter or carbon monoxide, respectively.

In Table 13, I analyze the effect of terror on the probability of obtaining a matriculation

certificate and on the quality of the certificate obtained at the student level. I exploit variation among students in their exposure to terror attacks shortly before an exam across all their matriculation tests. However, as mentioned earlier, there is a spurious correlation between a student's exposure to terror attacks shortly before an exam and his or her potential outcomes. Higher-achieving students have a higher probability of experiencing a terror attack before an exam because they take more exams in general and on specific days. As Table 3 indicates, students exposed to terror were tested in more exams and in exams of higher difficulty level. While my main analysis overcomes this problem by including student fixed effects and exam controls, these remedies are not applicable in the current setting because my observations are of students and not of exams. Therefore, in this analysis I limit the sample to include only exposed students. I define a measure for the average terror intensity to which the student is exposed. In particular, I add up the number of terror fatalities in a five-day window in the student's area before any exam that the student took during twelfth grade and divide the sum by the number of all exams the student took during twelfth grade.

Table 13 presents the estimated effects of terror intensity on average matriculation scores and the probability of receiving a matriculation certificate.[39] I carry out the analysis at the student level and control for year fixed effects and student's observed characteristics (parents' years of education, number of siblings, a gender indicator, a dummy for being born in Israel, and a set of indicators for ethnicity). In columns 1 and 3 the specifications also include area fixed effects and in columns 2 and 4 the specifications also include school fixed effects. In my preferred model with school fixed effects (column 2) I estimate that one standard deviation increase in the average number of fatalities (1.557) is associated with 0.42 unit reduction in a student's composite score and reduces the probability of obtaining a matriculation certificate by 2.7 percentage points. This suggests that a terror attack shortly before a matriculation exam is associated with a lower matriculation composite score and a lower probability of receiving the matriculation certificate. These outcomes

[39]The average matriculation score and the award of the certificate also depend on the outcomes of exams taken in grades 10 and 11, but since most exams are taken in twelfth grade there is enough power to identify an effect on the matriculation from performance in twelfth grade only.

may have a permanent impact on an individual's future. For example, Ebenstein et al. (2016) find a similar size effect of pollution on these two matriculation outcomes and, on further analysis, they show that these effects are negatively associated with post-secondary educational attainments and earnings. As a robustness check for my results, columns 3 and 4 replicate the estimations in columns 1 and 2 respectively, but assign a zero value to the terror-intensity measure for all students who are exposed to only one fatality during examinations. The purpose is to test whether exposure to one fatality is equivalent to no exposure at all. The results resemble those in columns 1 and 2, suggesting that the effect is indeed generated by the intensity of terror.

The identification assumption for inferring the aforementioned results as a causal relationship between terror and matriculation outcomes is that with the student's exposure to a terror attack before an exam as a given, the variation in terror intensity among these students is not correlated with potential outcomes, after conditioning on a student's school or area. In order to support this identification assumption I test whether the observed characteristics of the treated students are correlated with the terror intensity to which they were exposed. Table A5 in the Appendix reports the results from regressions of students' characteristics on the measure of terror intensity. I observe no significant association between students characteristic and terror intensity after conditioning on year fixed effects and area (column 1) or school (column 2) fixed effects.

9 Conclusions

This study explored the effect of terror on cognitive performance in exams. While the effect of terror on various aspects of the economy and society is well documented, our understanding of its causal effects on human capital is limited due to identification challenges and data limitations. I overcome this by exploring temporal and geographical variation in the frequency and intensity of terror attacks during the Second Intifada in Israel and by utilizing the special structure of the Israeli matriculation system.

Using a large sample of Israeli high-school matriculation examinations, I present

evidence that terror attacks with fatalities shortly before the exam have a significant negative impact on student performance. I find that the effect of terror is transitory and concentrated in the five days preceding the exam. The effect is driven mainly by attacks with a relatively high number of fatalities and decreases as the physical distance between the examinee's locality and attack location increases.

My results suggest that terror attacks affect student performance on tests mainly through stress that affects the learning process and cognitive acuity during the exam. Using within-student variation, I isolate the effects of terror from other possible channels (such as school quality, school accessibility, and education investment decisions) and overcome the potential effect of exposure to a sustained terrorist conflict. Hence, the implications of this study are relevant for developed countries that experience terror attacks in an intermittent manner, even when no damage was done to the functioning of the education system. My findings also can be generalized to the effect of terror on performance in other exams (e.g., SAT or university exams) and may be relevant for other activities that are associated with cognitive acuity, such as productivity at work.

This study provides evidence that terror attacks, apart from all their other adverse effects on society, temporarily impairs students' learning and exam performance. This result leads to more questions regarding the permanent effect of terror on a student's human capital formation. Although I find that the effect of terror is transitory, it is possible that there are lasting effects on human capital accumulation. A reduced form analysis performed in this study indicates a negative effect of terror on academic outcomes with long-term implications. I find that the intensity of a terror attack if it occurs before a matriculation exam is negatively associated with the probability of passing the exam, the probability of obtaining a matriculation certificate, and the quality of the certificate earned, which have meaningful long-term implications in determining access to college and admission to various programs or majors. The identification strategy used in this paper could be used for future research into the effect of terror on long-term human capital outcomes.

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Figure 1 – Daily Israeli Fatalities (Civilians and Security Forces) from Terror Attacks within Israel Excluding WB and GS (2001–2005)

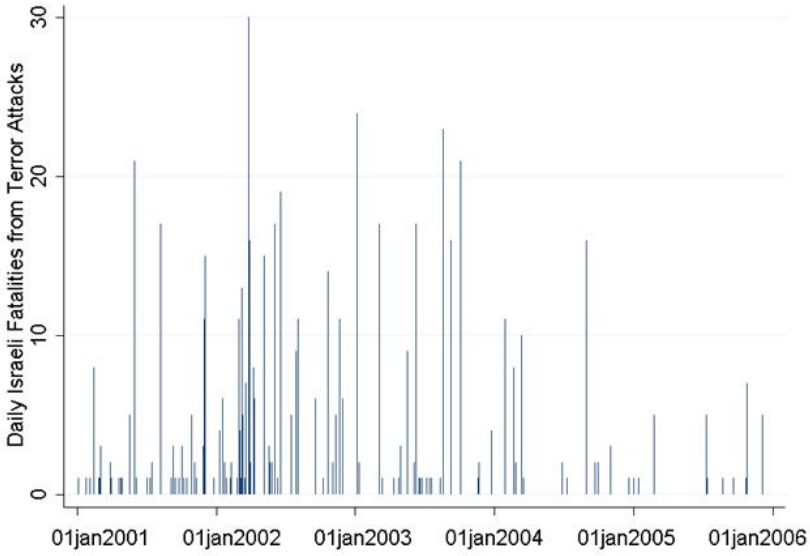


Figure 2 – Monthly Israeli Fatalities Stratified by Civilians and Members of Security Forces, from Terror Attacks within Israel Excluding WB and GS (2001–2005)

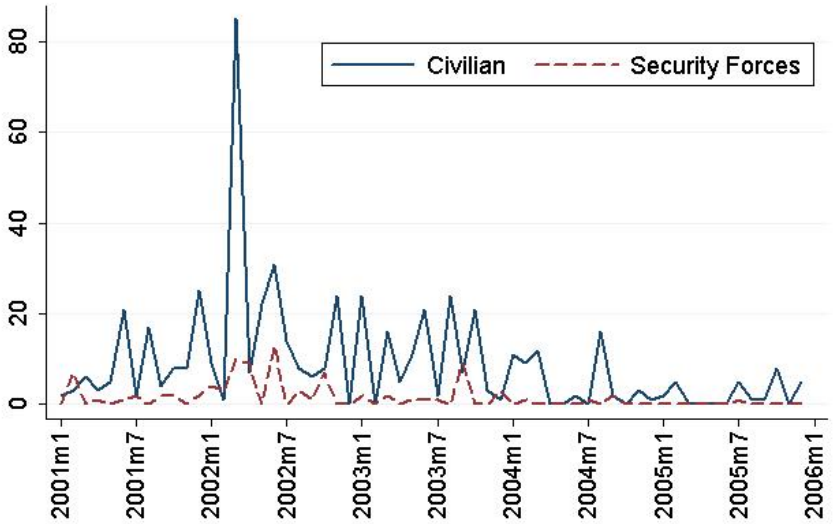


Figure 3 – Distribution of Fatalities from Terror Attacks across Natural Areas in Israel 2001-2005

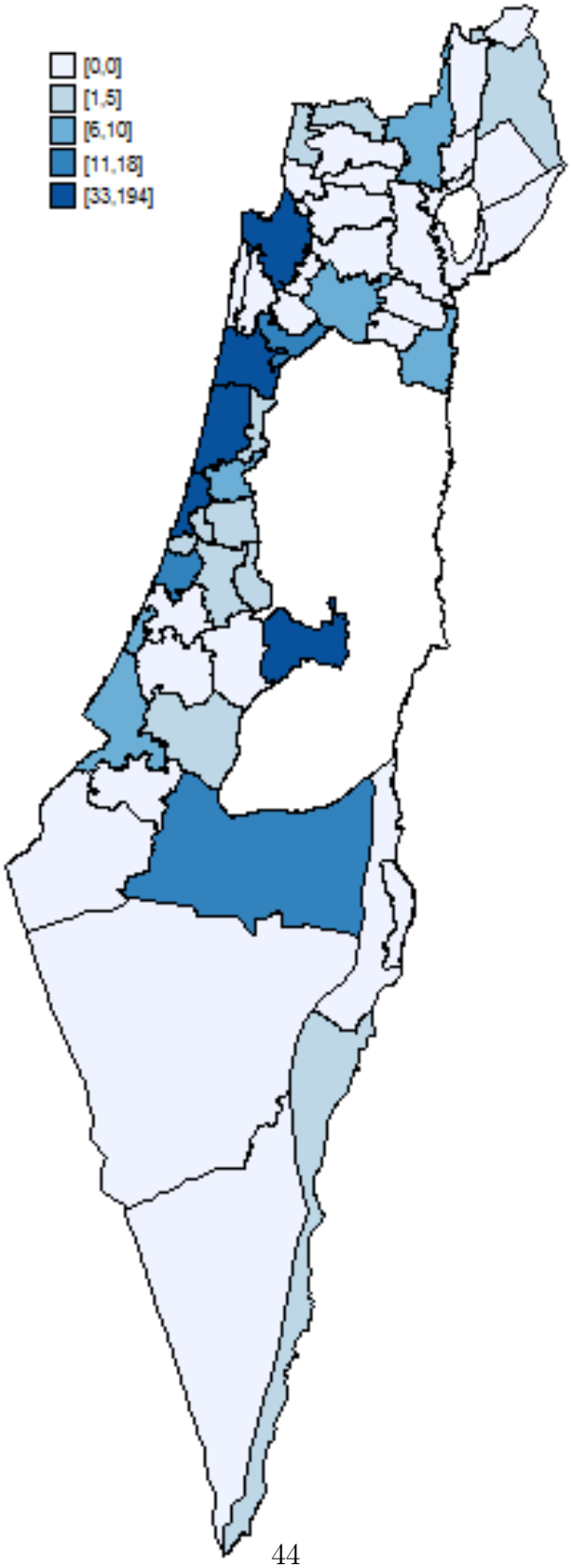
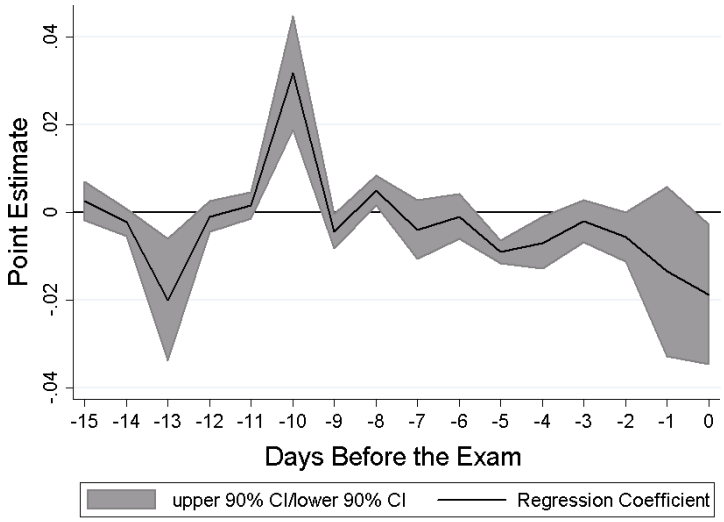
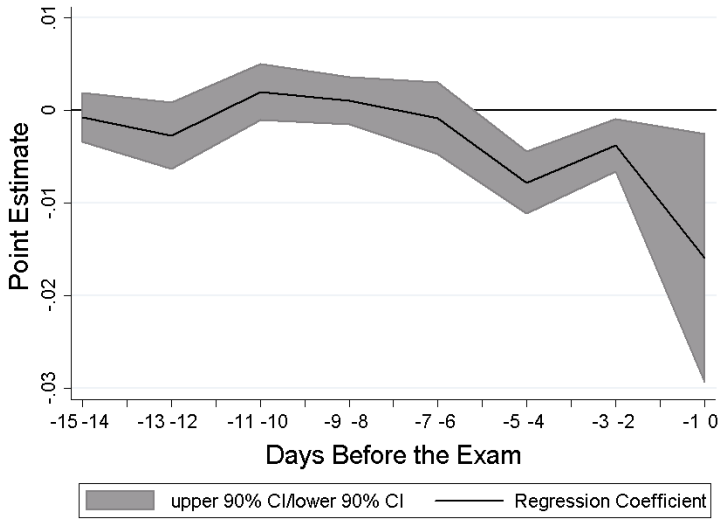


Figure 4 – Effect of Terrorism Fatalities on Matriculation Scores - 15-Day Lags



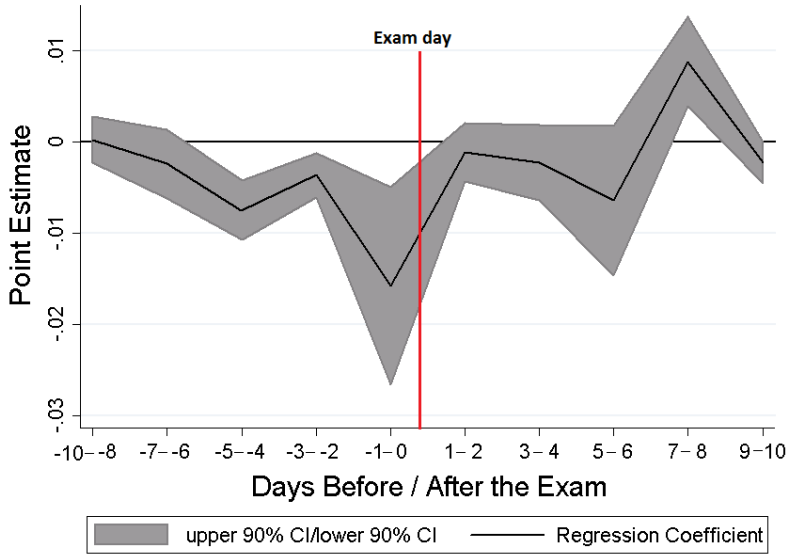
Notes: The figure plots the coefficients and their confidence intervals from a regression of standardized matriculation exam score on the number of Israeli fatalities from terror attack in the student's area on the same day of the exam and in the fifteen days prior to the exam, allowing for separate effect in each day. The regression also includes exam controls, time and student fixed effects. Standard errors are clustered at the school level.

Figure 5 – Effect of Terrorism Fatalities on Matriculation Score - 15-Day Lags (Collapsing Two Days)



[h!] Notes: The figure plots the coefficients and their confidence intervals from a regression of standardized matriculation exam score on the number of Israeli fatalities from terror attack in the student's area on the same day of the exam and in the fifteen days prior to the exam, allowing for separate effect in windows of two days. The regression also includes exam controls, time and student fixed effects. Standard errors are clustered at the school level.

Figure 6 – Effect of Terrorism Fatalities on Matriculation Scores with 10-Day Lags and 10-Day Leads (Collapsing Two Days)



Notes: The figure plots the coefficients and their confidence intervals from a regression of standardized matriculation exam score on the number of Israeli fatalities from terror attack in the student's area on the same day of the exam, in the ten days prior to, and in the ten days following the exam, allowing for separate effect in windows of two days. The regression also includes exam controls, time and student fixed effects. Standard errors are clustered at the school level.

Table 1. Civilians and Security Forces Fatalities from Terror Attacks and Number of Terror Incidents by District and Year

		Jerusalem	North	Haifa	Center	Tal Aviv	South	All
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
2001	Civilians	30	10	27	15	22	0	104
	Security forces	1	3	4	1	8	0	17
	Number of attacks	6	8	10	9	3	0	36
2002	Civilians	84	18	42	55	16	0	215
	Security forces	4	3	33	2	1	7	50
	Number of attacks	15	4	9	8	6	3	45
2003	Civilians	59	5	37	5	28	1	135
	Security forces	2	1	2	9	4	1	19
	Number of attacks	7	4	3	6	4	2	26
2004	Civilians	19	0	0	1	3	33	56
	Security forces	3	0	0	0	1	0	4
	Number of attacks	4	0	0	1	2	6	13
2005	Civilians	2	0	8	9	5	3	27
	Security forces	0	0	0	1	0	0	1
	Number of attacks	2	0	2	2	1	3	10
Total	Civilians	194	33	114	85	74	37	537
	Security forces	10	7	39	13	14	8	91
	Number of attacks	34	16	24	26	16	14	130

Notes: The table reports total number of civilian and security forces fatalities by district and year, as well as the total number of terror incidents by district and year.

Table 2. Distribution of Terror Fatalities in the Sample

	Exam level data		Student level data	
	Frequency	Percent (%)	Frequency	Percent (%)
Terror fatalities	(1)	(2)	(3)	(4)
0	1,917,886	98.39	227,131	91.65
1-5	21,107	1.08	13,330	5.38
6-10	5,226	0.27	3,866	1.56
11-26	4,979	0.26	3,491	1.41
Total Exposed	31,312	1.61	20,687	8.35
Total Observations	1,949,198	100	254,059	100

Notes: Terror fatalites is the number of of the Israeli fatalities from terror attack in a five-day window before an exam in the examinee's area. In column 1, each observation represents a matriculation exam; in column 3, each observation represents a student.

Table 3. Descriptive Statistics

		All students			Only exposed students		
	All	Exposed students	Unexposed students	Difference	Exposed exams questionnaires	Unexposed exams questionnaires	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Exam Level Data							
Exam score	72.312	73.411	72.204	1.207***	72.194	73.677	-1.482***
	(19.022)	(18.391)	(19.080)	[25.30]	(18.979)	(18.249)	[-12.93]
Internal school score	78.513	79.809	78.386	1.423***	79.147	79.953	-0.806***
	(14.644)	(14.113)	(14.689)	[38.74]	(14.472)	(14.029)	[-9.16]
Exam credit units	1.763	1.878	1.751	0.127***	2.205	1.807	0.398***
	(1.080)	(1.147)	(1.073)	[46.84]	(1.352)	(1.084)	[56.17]
Retake exam	0.065	0.071	0.065	0.006***	0.126	0.059	0.068***
	(0.247)	(0.257)	(0.246)	[10.32]	(0.332)	(0.235)	[42.42]
Failed exam	0.152	0.138	0.154	-0.016***	0.158	0.133	0.024***
	(0.359)	(0.344)	(0.361)	[-17.89]	(0.364)	(0.340)	[11.38]
Days between two exams	7.546	7.510	7.549	-0.039*	8.878	7.173	1.705***
	(6.802)	(6.343)	(6.846)	[-2.04]	(7.213)	(6.063)	[40.06]
Observation	1,949,198	174,482	1,774,716		31,312	143,170	

Notes: Standard deviations are presented in parentheses. In panel A, each observation represents a matriculation exam; in panel B, each observation represents a student. The sample in column 1 includes all twelfth-grade students from 421 Jewish secular and religious State high schools. In columns 2 and 3, the sample is split into students who exposed to fatal terror attack in a 5-day window before a matriculation exam in their area and student who did not. Column 4 reports the statistical difference between columns 2 and 3 based on a t-test (t-statistic presented in brackets). In columns 5 and 6, the sample includes only students who exposed to fatal terror attack in a 5-day window before a matriculation exam in their area while column 5 includes exposed exams and column 6 includes unexposed exams. Column 7 reports the statistical difference between columns 5 and 6 based on a t-test (t-statistic presented in brackets).

Table 3. Continued

	All	Exposed students	Unexposed students	Difference
	(1)	(2)	(3)	(4)
Panel B. Student Level Data				
Matriculation certification rate	0.749	0.809	0.743	0.065***
	(0.434)	(0.393)	(0.437)	[20.83]
Matriculation composite score	77.193	78.742	77.052	1.691***
	(10.883)	(10.596)	(10.898)	[21.39]
Total credit units in matriculation certificate	24.627	25.929	24.508	1.421***
	(6.409)	(5.729)	(6.454)	[30.59]
Number of exams in all high-school years	12.945	13.208	12.921	0.288***
	(4.147)	(3.365)	(4.210)	[9.56]
Number of exams in 12th grade	7.881	8.447	7.829	0.617***
	(2.667)	(2.341)	(2.689)	[31.94]
Religiosity indicator	0.170	0.225	0.165	0.060***
	(0.376)	(0.418)	(0.371)	[21.89]
Female indicator	0.546	0.545	0.546	-0.001
	(0.498)	(0.498)	(0.498)	[-0.32]
Father's years of education	11.430	11.697	11.406	0.290***
	(5.248)	(5.346)	(5.239)	[7.62]
Mother's years of education	11.491	11.891	11.454	0.437***
	(5.155)	(5.113)	(5.157)	[11.67]
Number of siblings	1.106	1.180	1.099	0.081***
	(1.199)	(1.250)	(1.194)	[9.28]
Native indicator (born in Israel)	0.810	0.809	0.810	-0.001
	(0.392)	(0.393)	(0.392)	[-0.25]
Former USSR ethnicity indicator	0.182	0.175	0.183	-0.008**
	(0.386)	(0.380)	(0.387)	[-2.99]
Asia-Africa ethnicity indicator	0.230	0.223	0.231	-0.007*
	(0.421)	(0.417)	(0.421)	[-2.36]
Europe-America ethnicity indicator	0.108	0.115	0.107	0.008***
	(0.310)	(0.319)	(0.309)	[3.46]
Ethiopian ethnicity indicator	0.017	0.015	0.018	-0.002*
	(0.131)	(0.123)	(0.132)	[-2.26]
Number of students	247818	20687	227131	
Number of schools	421	171	421	
Number of areas	37	14	37	

Notes: See previous table.

Table 4. Estimated Effect of Terror on Matriculation Score

	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities	-0.0006	-0.0030	-0.0049***	-0.0051***	-0.0079***	-0.0066***
	(0.0023)	(0.0021)	(0.0015)	(0.0014)	(0.0018)	(0.0016)
Time fixed effects		Yes	Yes	Yes	Yes	Yes
Student controls		Yes	Yes	Yes		
Area fixed effects			Yes			
School fixed effects				Yes		
Student fixed effects					Yes	Yes
Exam controls						Yes
R-Square	0.000	0.031	0.038	0.087	0.430	0.466
Schools	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities from a terror attack in the student's area within the 5-day window preceding the exam. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. Exam controls includes fixed effect for proficiency level (the total credit units in the exam's subject), indicator for the exam subject category (science, humanities, vocational), and indicators for selective or mandatory subject and retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 5. Heterogeneity in the Effect of Terror on Matriculation Scores across Sub-populations

	By gender		By religious orientation		By parents' education	
	Boys	Girls	Secular	Religious	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities	-0.0060***	-0.0075***	-0.0063***	-0.0056**	-0.0076***	-0.0053***
	(0.0021)	(0.0019)	(0.0021)	(0.0022)	(0.0021)	(0.0014)
P-value for difference in coefficient between the two subsamples	0.512		0.823		0.852	
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Student fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.468	0.471	0.475	0.457	0.460	0.447
Schools	361	377	278	143	420	407
Students	112,578	135,237	205,611	42,205	144,351	103,465
Observations	857,895	1,091,288	1,567,666	381,521	1,105,605	843,583

Note: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities from a terror attack in the student's area within the 5-daty window preceding the exam. Exam controls includes fixed effect for proficiency level, indicator for the exam subject category (science, humanities, vocational), and indicators for selective or mandatory subject and retake exam. In columns (1) and (2), the sample is stratified by gender. In columns (3) and (4), it is stratified by the school's religious orientation. In columns (5) and (6), it is stratified by parents' education. Column (5) includes students whose parents' total years of schooling is no more than twenty-four (the median value in the whole sample); Column (6) includes students whose parents' total years of schooling exceed twenty-four.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 6. Estimated Non-Linear Effect of Terror on Matriculation Scores

	Area Fixed Effects				School Fixed Effects				Student Fixed Effects			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(i) Indicator for fatalities>0	-0.025			0.009	-0.025			0.006	-0.033**			0.005
	(0.016)			(0.019)	(0.016)			(0.019)	(0.017)			(0.020)
(ii) Indicator for fatalities>5		-0.093***		-0.092**		-0.090***		-0.079*		-0.118***		-0.104**
		(0.025)		(0.045)		(0.028)		(0.046)		(0.031)		(0.047)
(iii) Indicator for fatalities>10			-0.079**	-0.090***			-0.079**	-0.089***			-0.129***	-0.131***
			(0.035)	(0.035)			(0.031)	(0.030)			(0.036)	(0.036)
P-value for (i)=(ii)=(iii):				0.006				0.008				0.002
P-value for (ii)=(iii):				0.687				0.726				0.645
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Schools	421	421	421	421	421	421	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each column in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable is an indicator for a terror attack in the 5 days preceding the exam in the student's area. In the first row, it refers to a terror attack with at least one fatality; in the second row it refers to a terror attack with more than five fatalities; and in the third row it refers to a terror attack with more than ten fatalities. In columns 4, 8 and 12 the analysis includes three indictors for a terror attack in the 5 days preceding the exam in the student's area. In the first row, it refers to a terror attack with at least one fatality but fewer than six fatalities; in the second row it refers to a terror attack with at least six fatalities but fewer than eleven; and in the third row it refers to a terror attack with more than ten fatalities. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. Exam controls include fixed effect of proficiency level, an indicator for the exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, and an indicator for a retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 7. Estimate the Effect of Future Terror on Matriculation Score - Testing for Different Timing Effect

	Area Fixed Effects			School Fixed Effects			Student Fixed Effects		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fatalities: 0-5 days before the exam	-0.0050***			-0.0050***			0.0008		
	(0.0015)			(0.0014)			(0.0011)		
Fatalities: 6-10 days before the exam	0.0005	0.0006		0.0007	0.0008		0.0003	0.0011	
	(0.0013)	(0.0013)		(0.0011)	(0.0011)		(0.0011)	(0.0011)	
Fatalities: 11-15 days before the exam	0.0002		0.0003	-0.0000		0.0001	-0.0064***		0.0007
	(0.0014)		(0.0014)	(0.0013)		(0.0013)	(0.0015)		(0.0012)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes	Yes	Yes			
Schools	421	421	421	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each column in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities in the student's area within three distinct periods: (1) 1–5 days before the exam date (including the exam day but before the exam started); (2) 6–10 days before the exam date; (3) 11-15 days before the exam date. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. Exam controls includes fixed effect for proficiency level, an indicator for the exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, *Significant at 10%; **significant at 5%; ***significant at 1%

Table 8. Placebo Test - Estimated Effect of Future Terror on Matriculation Score

	Area Fixed Effects		School Fixed Effects		Student Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities: 5 days before exam	-0.0050***		-0.0051***		-0.0066***	
	(0.0015)		(0.0014)		(0.0016)	
Fatalities: 5 days after exam	0.0005	0.0004	0.0010	0.0009	-0.0004	-0.0003
	(0.0018)	(0.0018)	(0.0014)	(0.0014)	(0.0016)	(0.0016)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes		
Schools	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each column in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" in the first row is the number of Israeli fatalities from a terror attack in the student's area in the 5-day window preceding the exam. The independent variable "Fatalities" in the second row is the number of Israeli fatalities from a terror attack in the student's area in the 5-day window following the exam. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic origin indicators. Exam controls includes fixed effect for proficiency level, an indicator for the exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, and an indicator for a retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 9. Estimated Effect of Terror on Matriculation Score - Subject-by-Level Fixed Effects

	Area Fixed Effects		School Fixed Effects	
	(1)	(2)	(3)	(4)
Fatalities	-0.0047***	-0.0015	-0.0041***	-0.0021**
	(0.0015)	(0.0011)	(0.0014)	(0.0011)
Time fixed effects	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes
Internal school score		Yes		Yes
Schools	421	421	421	421
Students	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities from a terror attack in the student's area within the 5-day window preceding the exam. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. The internal school score is composed of a score given to students based on coursework throughout the academic year and an end of-year exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 10. Estimated Effect of Terror on Matriculation Scores by Distance

	Area Fixed Effects			School Fixed Effects			Students Fixed Effects		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fatalities in own area	-0.005***	-0.004**	-0.005***	-0.005***	-0.005***	-0.005***	-0.007***	-0.007***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Fatalities in rest of subdistrict	0.003*	0.002	0.003*	0.002	0.002	0.002	-0.001	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Fatalities in rest of district	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.000	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Fatalities in rest of country		0.000			-0.001*			-0.002***	
		(0.001)			(0.001)			(0.001)	
Fatalities in rest of country including Occupied Territories)			0.000			-0.001**			-0.003***
			(0.001)			(0.000)			(0.001)
P-value for difference between the above coefficients:	0.003	0.047	0.007	0.003	0.006	0.002	0.000	0.000	0.000
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes	Yes	Yes			
Schools	421	421	421	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Note: Standard errors reported in parentheses are clustered at the school level. Each column in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities from a terror attack in the 5 days preceding the exam in four distinct regions: (1) in the student's area; (2) in the student's subdistrict but outside the student's area; (3) in the student's district but outside the student's subdistrict; (4) in Israel (in the third row excluding the West Bank and the Gaza Strip and in the fourth row including the West Bank and the Gaza Strip) but outside the student's district. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. Exam controls includes fixed effect for proficiency level, an indicator for the exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, and an indicator for a retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 11. Estimated Effect of Terror on Matriculation Scores - Robustness Checks for Sample Selection

	Excluding students living outside of school area			Excluding security forces fatalities			Including West Bank and Gaza Strip		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fatalities	-0.0046***	-0.0044***	-0.0060***	-0.0054***	-0.0054***	-0.0071***	-0.0045***	-0.0044***	-0.0073***
	(0.0016)	(0.0013)	(0.0017)	(0.0016)	(0.0014)	(0.0017)	(0.0015)	(0.0014)	(0.0016)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes		Yes	Yes		Yes	Yes	
Area fixed effects	Yes			Yes			Yes		
School fixed effect		Yes			Yes			Yes	
Student fixed effects			Yes			Yes			Yes
Schools	421	421	421	421	421	421	446	446	446
Students	233,782	233,782	233,782	247,816	247,816	247,816	254,057	254,057	254,057
Observations	1,835,499	1,835,499	1,835,499	1,949,188	1,949,188	1,949,188	1,999,299	1,999,299	1,999,299

Note: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable "Fatalities" is the number of Israeli fatalities from a terror attack in the student's area within the 5-day window preceding the exam. In columns 1–3, "Fatalities" refer to civilians and security forces; in columns 4-6, it refer to civilians only. In columns 7-9, "Fatalities" refer to civilians and security forces within Israel's pre-1967 frontiers and civilians only in the West Bank and Gaza Strip. In columns 1-3, the analysis excludes students residing in a areas other than that of their school. In columns 6-9, the analysis includes Jewish students residing in the West Bank and the Gaza Strip.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 12. Estimate the Effect of Terror on the Probability of Passing the Matriculation Exam

	Area Fixed Effects		School Fixed Effects		Student Fixed Effects	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Linear Effect						
Fatalities	-0.0019***	-0.0015***	-0.0018***	-0.0015***	-0.0019***	-0.0016***
	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Panel B. Non-linear effect						
Indicator for fatalities>5	-0.0207***	-0.0157***	-0.0185**	-0.0158**	-0.0191**	-0.0162**
	(0.0068)	(0.0060)	(0.0072)	(0.0064)	(0.0075)	(0.0069)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes		
Student controls		Yes		Yes		Yes
R-Square	0.052	0.145	0.084	0.165	0.337	0.370
Schools	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1949198.00	1949198.00	1949198.00	1949198.00	1949198.00	1949198.00

Notes: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. Each observation is an exam. The dependent variable is a dummy variable that is equal to 1 if the exam score is greater than 55, i.e., a passing score. The independent variable "Fatalities" in Panel A is the number of terror fatalities in the student's area in a five-day window preceding the exam. The independent variable "indicator for fatalities>5" in Panel B is an indicator for a terror attack with more than 5 fatalities in the five days preceding the exam in the student's area. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators. Exam controls includes a fixed effect for proficiency level (for both the exam and the total credit units in the subject of the exam), an indicator for the exam subject category (science, humanities, vocational), an indicator for selective or mandatory subject, and an indicator for a retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table 13. Estimate the Effect of Terror on Matriculation Outcomes with Long-Term Implications

	Main Analysis		Robustness check	
	Area Fixed Effects	School Fixed Effects	Area Fixed Effects	School Fixed Effects
	(1)	(2)	(3)	(4)
Panel A. matriculation exams composite score				
Average fatalities across all exams	-0.499**	-0.270*	-0.482**	-0.246*
	(0.215)	(0.156)	(0.209)	(0.149)
Panel B. Received a matriculation certificate (1=yes)				
Average fatalities across all exams	-0.031***	-0.027***	-0.030***	-0.025***
	(0.008)	(0.006)	(0.007)	(0.006)
Year fixed effects	Yes	Yes	Yes	Yes
Student controls	Yes	Yes	Yes	Yes
Area fixed effects	Yes		Yes	
School fixed effects		Yes		Yes
Areas	14	14	14	14
Schools	171	171	171	171
Students	20,687	20,687	20,687	20,687

Notes: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. Each observation is a student and the sample includes only students whose Ares saw a terror attack in the five days before at least one of their matriculation exams. In Panel A, the dependent variable is the matriculation exams composite score. In Panel B, the dependent variable is a dummy variable that is equal to 1 if the student received a matriculation certificate. The independent variable is average fatalities in the five-day window before any exam for all exams taken in Grade 12 for each student. In columns (3) and (4), the independent variable is equal to zero if an average fatality is 1. Student controls include a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and ethnic-origin indicators.

*Significant at 10%; **significant at 5%; ***significant at 1%

APPENDIX

Table A1. Israeli Fatalities from Terror Attacks (2001-2005)
by Districts, Subdistricts, and Natural Regions

District	Sub-district	Natural area	Civilian fatalities 2001-2005	Security forces fatalities 2001-2005	Number of attacks with civilian fatalities 2001-2005
Jerusalem	Jerusalem	Judean Mountains	194	10	31
		Judean Foothills	0	0	0
Northern	Zefat	Hula Basin	0	0	0
		Eastern Upper Galilee	6	3	1
		Hazor Region	0	0	0
	Kinneret	Kinnerot	0	0	0
		Eastern Lower Galilee	0	0	0
	Yizre'el	Bet She'an Basin	9	1	4
		Harod Valley	0	0	0
		Kokhav Plateau	0	0	0
		Yisre'el Basin	9	1	5
		Yoqne'am Region	0	0	0
		Menashe Plateau	0	0	0
	Akko	Nazareth-Tir'an Mountains	0	1	0
		Shefar'am Region	0	0	0
		Karmi'el Region	0	0	0
		Yehi'am Region	0	0	0
		Elon Region	5	0	1
		Nahariyya Region	3	1	2
		Akko Region	0	0	0
	Golan	Hermon Region	0	0	0
		Northern Golan	1	0	1
		Middle Golan	0	0	0
		Southern Golan	0	0	0
Haifa	Haifa	Haifa Region	70	9	7
		Karmel Coast	0	0	0
	Hadera	Zikhron Ya'aqov Region	0	0	0
		Alexcander Mountain	11	19	4
Central	Sharon	Hadera Region	33	11	9
		Western Sharon	50	3	7
		Eastern Sharon	4	1	4
	Petah Tiqwa	Southern Sharon	7	0	5
		Petah Tiqwa Region	4	0	3
	Ramla	Modiin Region	2	0	2
		Ramla Region	1	0	1
	Rehovot	Rehovot Region	0	0	0
		Rishon LeZiyyon Region	17	9	2
Tel Aviv	Tel Aviv	Tel Aviv Region	71	4	12
		Ramat Gan Region	2	3	2
		Holon Region	1	7	1
Southern	Ashqelon	Mal'akhi Region	0	0	0
		Lakhish Region	2	0	2
		Ashdod Region	10	0	1
		Ashqelon Region	6	0	4
	Be'er Sheva	Gerar Region	0	0	0
		Besor Region	0	5	0
		Be'er Sheva Region	18	2	2
		Dead Sea Region	0	0	0
		Arava Region	1	0	1
		Northern Negev Mountains	0	1	0
		Southern Negev Mountain	0	0	0
WB and GS			205	210	123

Notes: The Table present the number of civilian and security forces fatalities as well as the number of terror incidents with civilian fatalities by natural areas. Areas without any schools in the data are marked in gray. Fatalities from terror attacks in these areas were assign to the nearest area with schools.

Table A2. Effect of a Terror Fatalities on Matriculation Score with 10 Days Lags

	One Day Each Lag			Two Days Each Lag		
	(1)	(2)	(3)	(4)	(5)	(6)
Fatalities in the same day of the exam	-0.008	-0.016**	-0.019*			
	(0.010)	(0.008)	(0.010)	-0.003	-0.006**	-0.016*
Fatalities 1 days before the exam	-0.001	-0.002	-0.014	(0.004)	(0.003)	(0.008)
	(0.004)	(0.004)	(0.012)			
Fatalities 2 days before the exam	-0.007	-0.003	-0.006*			
	(0.005)	(0.003)	(0.003)	-0.005	-0.003	-0.004**
Fatalities 3 days before the exam	-0.003	-0.002	-0.002	(0.003)	(0.002)	(0.002)
	(0.005)	(0.003)	(0.003)			
Fatalities 4 days before the exam	-0.010**	-0.008**	-0.007**			
	(0.004)	(0.004)	(0.004)	-0.005***	-0.007***	-0.008***
Fatalities 5 days before the exam	-0.002	-0.006**	-0.009***	(0.002)	(0.002)	(0.002)
	(0.002)	(0.002)	(0.002)			
Fatalities 6 days before the exam	0.002	-0.001	-0.001			
	(0.003)	(0.003)	(0.003)	-0.000	-0.002	-0.001
Fatalities 7 days before the exam	-0.005	-0.005	-0.004	(0.002)	(0.002)	(0.002)
	(0.004)	(0.004)	(0.004)			
Fatalities 8 days before the exam	0.002	0.004**	0.005**			
	(0.003)	(0.002)	(0.002)	0.001	0.002	0.001
Fatalities 9 days before the exam	0.000	-0.002	-0.004*	(0.002)	(0.001)	(0.002)
	(0.003)	(0.002)	(0.002)			
Fatalities 10 days before the exam	0.024**	0.023***	0.032***			
	(0.010)	(0.008)	(0.008)	0.001	0.002	0.002
Fatalities 11 days before the exam	0.001	0.001	0.002	(0.002)	(0.002)	(0.002)
	(0.002)	(0.002)	(0.002)			
Fatalities 12 days before the exam	-0.002	-0.002	-0.001			
	(0.003)	(0.002)	(0.002)	-0.002	-0.003	-0.003
Fatalities 13 days before the exam	-0.006	-0.006	-0.020**	(0.003)	(0.002)	(0.002)
	(0.007)	(0.006)	(0.008)			
Fatalities 14 days before the exam	-0.002	-0.002	-0.002			
	(0.002)	(0.002)	(0.002)	0.001	-0.001	-0.000
Fatalities 15 days before the exam	0.003	0.001	0.002	(0.002)	(0.002)	(0.002)
	(0.003)	(0.003)	(0.003)			
Time fixed effect	Yes	Yes	Yes		Yes	Yes
Exam controls	Yes	Yes	Yes	Yes	Yes	Yes
Student controls	Yes	Yes		Yes	Yes	Yes
Area fixed effect	Yes			Yes		
School fixed effect		Yes			Yes	
Student fixed effects			Yes			Yes
Schools	421	421	421	421	421	421
Students	247,818	247,818	247,818	247,818	247,818	247,818
Observations	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198	1,949,198

Notes: Standard errors reported in parentheses are clustered at the school level. Each column in the table represents a separate regression. The dependent variable is standardized matriculation exam score. "Fatalities" in the independent variables refer to number of Israeli fatalities from terror attack in the student's area. Student controls include gender dummy, both parents' years of schooling, number of siblings, born in Israel indicator and ethnic origin indicators. Exam controls includes fixed effect for proficiency level, indicator for the exam subject category (science, humanities and professional), indicator for selective or mandatory subject and indicator for retake exam.

*Significant at 10%; **significant at 5%; ***significant at 1%

Table A3. The Correlation between Students' Characteristics and Terror Intensity among Exposed Students

	Area Fixed Effects	School Fixed Effects
	(1)	(2)
Female	0.012	-0.008
	(0.011)	(0.007)
Father's years of education	0.102	0.053
	(0.097)	(0.070)
Mother's years of education	0.094	0.020
	(0.098)	(0.068)
Number of siblings	0.016	0.006
	(0.021)	(0.009)
Native indicator (born in Israel)	0.006	0.005
	(0.005)	(0.003)
Areas	14	14
Schools	171	171
Students	20,687	20,687

Notes: Standard errors reported in parentheses are clustered at the school level. Each cell in the table represents a separate regression. Each observation is a student and the sample includes only students whose areas saw a terror attack in the five-day window preceding at least one of their matriculation exams. The dependent variables are students' characteristics (dummy for female, both parents' years of schooling, number of siblings and a born-in-Israel indicator). The independent variable is average fatalities in the five-day window before any exam for all exams taken in Grade 12 for each student. All specifications includes time fixed effects.

*Significant at 10%; **significant at 5%; ***significant at 1%