Too Scared for School? Effects of Terrorism on Students' Achievement

Adi Shany

Online Appendix

Table A1

Sample Matriculation Certificate (Panel A) and Exam Schedule and Scores (Panel B)

A. Matriculation Certificate

Subject	Subject type	Credit units	Final score
Hebrew	core	2	84
Bible	core	2	82
Literature	core	2	73
English	core	5	86
History	core	2	87
Political sci.	core	1	80
Math	core	4	93
Chemistry	elective	2	82
Total / Avg.		**23**	**84.5**

B. Exam Schedule and Scores

Grade	Examination period	Date	Subject	Credit units	Score		
					Internal	Exam	Final
10th	Summer	6/15/2001	History	1	90	91	91
10th	Summer	6/29/2001	Hebrew	1	85	79	82
11th	Summer	6/03/2002	Math	1	84	98	91
11th	Summer	6/16/2002	History	1	96	75	85
11th	Summer	6/26/2002	Bible	2	80	83	82
12th	Summer	5/08/2003	Hebrew	1	88	81	85
12th	Summer	5/22/2003	English	5	88	84	86
12th	Summer	6/02/2003	Math	2	97	98	98
12th	Summer	6/26/2003	Political sci.	1	83	76	80
12th	Summer	7/08/2003	Chemistry	2	86	87	87
12th	Summer	7/08/2003	Chemistry	3	78	80	79

Table A2

Effect of Terror Fatalities on Matriculation Scores, Different Samples

	Including Jewish Students Living in the WB & GS	Including Students in Regional Schools	Excluding Students Living Outside of School Area	Only Exposed Students
	(1)	(2)	(3)	(4)
# Fatalities	-0.0055***	-0.0047***	-0.0044***	-0.0044***
(4-day window)	(0.0017)	(0.0014)	(0.0014)	(0.0015)
Fixed Effects				
Student by exam period	x	x	x	x
Subject	x	x	x	x
Schools	517	490	448	159
Students	291,792	284,845	186,570	17,023
N (Exams)	2,287,020	2,230,809	1,455,451	143,376

Notes: Standard errors reported in parentheses are clustered at the area and date level. Each cell in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. The independent variable is the number of Israeli fatalities from a terror attack in the student's area within the four-day window preceding the exam. All regressions include fixed effects for proficiency level (for both the subject and the specific exam) and an indicator for a retake exam. The sample in Column 1 includes all 12th-grade students in the regular Jewish state system who took matriculation exams during the years 2001–2005, and also Jewish Israeli students residing in the West Bank or Gaza Strip. The sample in Column 2 includes the main Jewish state-school sample, and also students studying in regional schools. The sample in Column 3 represents the main Jewish state-school sample but excludes students residing outside their school area. The sample in Column 4 includes only exposed students; that is, students who were exposed to a fatal terror attack in the four days preceding at least one of their matriculation exams.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3

Balancing Test—Student-Level Data

	Exposed Students	Unexposed Students	Difference	Conditional Difference
	(1)	(2)	(3)	(4)
i. Matriculation Variables:				
Matriculation certification	0.812	0.744	0.068***	0.073***
	(0.391)	(0.436)	[0.016]	[0.015]
Matriculation composite score	78.77	77.07	1.700***	1.308**
	(10.66)	(10.89)	[0.606]	[0.560]
Total matriculation credit units	26.05	24.60	1.444***	1.717**
	(5.700)	(6.293)	[0.338]	[0.367]
# Exams, all high-school years	13.36	13.01	0.347	1.273***
	(3.389)	(4.146)	[0.413]	[0.247]
# Exams, 12th grade	8.438	7.839	0.599*	1.140***
	(2.401)	(2.681)	[0.357]	[0.209]
ii. Background Characteristics:				
Religiosity school	0.245	0.165	0.081***	0.045
	(0.430)	(0.371)	[0.029]	[0.032]
Female	0.548	0.545	0.003	0.009
	(0.498)	(0.498)	[0.018]	[0.020]
Father's years of education	12.43	11.99	0.444*	0.071
	(4.728)	(4.756)	[0.245]	[0.162]
Mother's years of education	12.63	12.14	0.492*	0.0312
	(4.381)	(4.510)	[0.252]	[0.154]
Number of siblings	1.286	1.167	0.119**	0.051*
	(1.341)	(1.249)	[0.059]	[0.029]
Native	0.812	0.810	0.003	-0.010
	(0.390)	(0.393)	[0.019]	[0.012]
N (Students)	17,023	231,010		

Notes: Each observation represents a student. Columns 1 and 2 report means and standard deviations (in parentheses) for students exposed (Column 1) and not exposed (Column 2) to a fatal terror attack in their area of residence in the four-day window before a matriculation exam. Column 3 reports the statistical difference and standard errors (in brackets) between columns 1 and 2. Column 4 reports the statistical difference and standard errors (in brackets) between columns 1 and 2 conditional on area and year fixed effects. Standard errors are clustered at the area and year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4

Balancing Test—Exam-Level Data

	All Students				Only Exposed Students			
	Exposed Students	Unexposed Students	Difference	Conditional Difference	Exposed Exams	Unexposed Exams	Difference	Conditional Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i. Exam Outcomes								
Exam score	73.36	72.22	1.132***	0.668	71.88	73.67	-1.791	-1.303
	(18.39)	(19.07)	[0.439]	[0.441]	(18.87)	(18.28)	[1.220]	[0.953]
Failed exam	0.138	0.153	-0.015**	-0.007	0.159	0.134	0.025	0.018
	(0.345)	(0.360)	[0.007]	[0.007]	(0.366)	(0.340)	[0.022]	[0.018]
Exam preceding a retake	0.058	0.048	0.010	0.022*	0.036	0.062	-0.026	-0.002
	(0.233)	(0.213)	[0.012]	[0.013]	(0.186)	(0.242)	[0.022]	[0.020]
ii. Exam Characteristics								
Exam credit units	1.873	1.754	0.119	-0.005	2.331	1.775	0.557*	0.476
	(1.152)	(1.073)	[0.090]	[0.085]	(1.460)	(1.049)	[0.326]	[0.332]
Exam's subject total credit units	3.077	3.037	0.039	0.102	3.588	2.968	0.621**	0.561*
	(1.561)	(1.544)	[0.118]	[0.114]	(1.413)	(1.569)	[0.282]	[0.303]
Exam in elective subject	0.226	0.197	0.029	0.032	0.271	0.216	0.055	0.091
	(0.418)	(0.398)	[0.027]	[0.028]	(0.445)	(0.411)	[0.099]	[0.105]
Exam in STEM subject	0.269	0.248	0.021	0.025	0.266	0.278	-0.052	-0.075
	(0.197)	(0.186)	[0.038]	[0.036]	(0.175)	(0.201)	[0.100]	[0.086]
Retake exam	0.074	0.064	0.009	0.003	0.149	0.058	0.091	-0.0008
	(0.261)	(0.246)	[0.014]	[0.002]	(0.356)	(0.233)	[0.070]	[0.004]
Days between exams	8.356	8.444	-0.088	-0.785***	9.566	8.072	1.493**	1.707***
	(5.925)	(6.565)	[0.296]	[0.302]	(6.541)	(5.734)	[0.748]	[0.651]
N (Exams)	143,376	1,807,242			25,194	118,182		

Notes: Each observation represents a matriculation exam. Columns 1 and 2 report means and standard deviations (in parentheses) for students exposed (Column 1) and not exposed (Column 2) to a fatal terror attack in their area of residence in the four-day window before a matriculation exam. Column 3 reports the statistical difference and standard errors (in brackets) between Columns 1 and 2. Column 4 reports the statistical difference and standard errors (in brackets) between Columns 1 and 2 conditional on area and exam-period fixed effects. Columns 5 and 6 report means and standard deviations for exposed and unexposed exams respectively, where both relate only to students exposed to a fatal terror attack in their area of residence in the four-day window before a matriculation exam. Column 7 reports the statistical difference and standard errors (in brackets) between Columns 5 and 6. Column 8 reports the statistical difference and standard errors (in brackets) between Columns 5 and 6 conditional on area and exam-period fixed effects. Standard errors are clustered at the area and date level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5

Effect of Terror Fatalities on Number of Exams Taken

	Number of Exams Taken in Summer Exam Period			Number of Exams Taken in 12th Grade		
	(1)	(2)	(3)	(4)	(5)	(6)
# Fatalities during summer examination period	-0.0038 (0.0027)			0.0014 (0.0024)		
# Fatalities during spring semester		0.0002 (0.0022)			0.0013 (0.0015)	
# Fatalities during the academic year			-0.00002 (0.0016)			0.0008 (0.0012)
Controls						
Year fixed effects	x	x	x	x	x	x
School fixed effects	x	x	x	x	x	x
Student characteristics	x	x	x	x	x	x
Schools	420	420	420	420	420	420
N (Students)	248,033	248,033	248,033	248,033	248,033	248,033

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. The dependent variable in Columns 1–3 is the number of exams taken by the student in the summer exam period, and the dependent variable in Columns 4–6 is the number of exams taken by the student during the 12th grade. The independent variable in the first row is the number of Israeli fatalities from a terror attack in the student's area during the summer examination period (that is, during May and June). The independent variable in the second row is the number of Israeli fatalities from a terror attack in the student's area during the spring semester (that is, February to June). The independent variable in the third row is the number of Israeli fatalities from a terror attack in the student's area during the academic year (that is, September to June). All specifications include year and school fixed effects and the following student controls: a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and an ethnic- origin indicator. The sample comprises all 12th-grade students in the regular Jewish state system who took matriculation exams during the years 2001–2005.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6

Robustness Check for the Short-Term Effect of Terror Fatalities on Matriculation Scores

	Time Window of Exposure							
	4 Days		30 Days		60 Days		90 Days	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Linear Effect								
# Fatalities	-0.0047**	-0.0040**	-0.0002	-0.0004	0.00001	0.00003	-0.0003	0.00020
	(0.0020)	(0.0019)	(0.0008)	(0.0010)	(0.00061)	(0.00074)	(0.00047)	(0.00055)
Panel B: Nonlinear Effect								
Any attack with # fatalities > 5	-0.0801***	-0.0709***	-0.0019	-0.0021	-0.0093	-0.0028	-0.0010	0.0002
	(0.0202)	(0.0197)	(0.0146)	(0.0185)	(0.0128)	(0.0156)	(0.0118)	(0.0141)
Controls								
Exam fixed effects	x	x	x	x	x	x	x	x
Year fixed effects	x	x	x	x	x	x	x	x
School fixed effects	x	x	x	x	x	x	x	x
Student characteristics		x		x		x		x
Subject fixed effects		x		x		x		x
# Previous exams fixed effects		x		x		x		x
Schools	420	420	420	420	420	420	420	420
Students	246,922	246,922	246,922	246,922	246,922	246,922	246,922	246,922
N (Exams)	1,665,252	1,665,252	1,665,252	1,665,252	1,665,252	1,665,252	1,665,252	1,665,252

Notes: Standard errors reported in parentheses are clustered at the area and date level. Each cell in each panel in the table represents a separate regression. The dependent variable is the standardized matriculation exam score. In Panel A the independent variable is the number of Israeli fatalities from a terror attack in the student's area within the relevant time window preceding the exam. In Panel B the independent variable is an indicator for at least one terror attack causing more than five fatalities in the student's area within the relevant time window preceding the exam. All specifications include year fixed effects, school fixed effects and exam fixed effects. The specifications in even-numbered columns also include student controls (a gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and a set of indicators for ethnicity), subject fixed effects, and fixed effects for the number of exams taken in the same exam period but before the current exam. The sample comprises all 12th-grade students in the regular Jewish state system who took at least one matriculation exam during the summer exam period in the years 2001–2005.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7

Correlation Between Terror Fatalities and Student Characteristics

	Female	Father's Schooling	Mother's Schooling	Siblings	Native
	(1)	(2)	(3)	(4)	(5)
Panel A: Terror Exposure During the Exam Period					
# Fatalities	0.0003	-0.0104	-0.0085	0.0001	-0.0002
	(0.0002)	(0.0077)	(0.0088)	(0.0005)	(0.0002)
Any attack with # fatalities > 5	0.0077	-0.2258	-0.1490	0.0032	-0.0036
	(0.0052)	(0.1942)	(0.2300)	(0.0109)	(0.0043)
Panel B: Terror Exposure During the Spring Semester					
# Fatalities	0.000001	-0.0029	-0.0032	-0.0002	-0.0001
	(0.0001)	(0.0035)	(0.0038)	(0.0003)	(0.0001)
Any attack with # fatalities > 5	0.0024	-0.1225	-0.0080	-0.0015	-0.0017
	(0.0036)	(0.1200)	(0.1411)	(0.0086)	(0.0029)
Fixed Effects					
School	x	x	x	x	x
Year	x	x	x	x	x
Schools	420	420	420	420	420
Students	246,922	246,922	246,922	246,922	246,922
N (Exams)	1,665,252	1,665,252	1,665,252	1,665,252	1,665,252

Notes: Standard errors reported in parentheses are clustered at the school level. Each cell in each panel in the table represents a separate regression. Each observation is a student. In Panel A the independent variable in the first row is the number of fatalities in the student's area during the summer exam period of 12th grade (that is, during May and June), and the independent variable in the second row is an indicator for at least one terror attack causing more than five fatalities in the student's area during the summer exam period of 12th grade. In Panel B the independent variable in the first row is the number of fatalities in the student's area during the spring semester of 12th grade (that is, February to June), and the independent variable in the second row is an indicator for at least one terror attack causing more than five fatalities in the student's area during the spring semester of 12th grade. All specifications include year and school fixed effects. The sample comprises all 12th-grade students in the regular Jewish state system who took at least one matriculation exam during the summer exam period in the years 2001–2005.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8

Balancing Test for Background Characteristics—Matched Sample

	Exposed Students	Unexposed Students	Difference	Conditional Difference
	(1)	(2)	(3)	(4)
Female	0.453	0.461	-0.008	-0.017***
	(0.498)	(0.498)	[0.005]	[0.006]
Father's years of education	12.46	12.300	0.159	-0.041
	(4.703)	(4.810)	[0.102]	[0.103]
Mother's years of education	12.67	12.57	0.100	-0.066
	(4.355)	(4.402)	[0.107]	[0.096]
Number of siblings	1.279	1.269	-0.009	0.003
	(1.337)	(1.339)	[0.015]	[0.015]
Native	0.812	0.821	-0.009*	0.005
	(0.391)	(0.384)	[0.005]	[0.005]
N (Students)	16,241	16,241		

Notes: Each observation represents a student. Columns 1 and 2 report means and standard deviations (in parentheses) for students exposed (Column 1) to a fatal terror attack in their area of residence in the four-day window before a matriculation exam and matched unexposed students (Column 2). Column 3 reports the statistical difference and standard errors (in brackets) between columns 1 and 2. Column 4 reports the statistical difference and standard errors (in brackets) between Columns 1 and 2 conditional on school and year fixed effects. Standard errors are clustered at the school level. The matched sample includes 32,482 12th-grade students in the regular Jewish state system who took matriculation exams in 2001–2005, comprising 16,241 students who were exposed to a fatal terror attack in the four-day window before at least one of their matriculation exams, and a matched group of 16,241 students from the same schools who took the same number of matriculation exams but who were not exposed to a fatal terror attack in the four-day window before any of their matriculation exams.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9

Effect of Short-Term Exposure to Terror on Matriculation Outcomes with Long-Term Implications—Matched Sample

	Received a Matriculation Certificate (1=Yes, 0=No)			Matriculation Composite Score		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
Average fatalities across all exams	-0.002	-0.003	-0.001	-0.217*	-0.206	-0.168
	(0.003)	(0.004)	(0.004)	(0.114)	(0.132)	(0.126)
# Fatalities during spring semester		0.00018			-0.00182	
		(0.00029)			(0.00791)	
# Fatalities during academic year			-0.00006			-0.00852
			(0.00022)			(0.00625)
Panel B:						
# Exposed exams with # fatalities > 5	-0.00004	-0.001	0.0008	-0.564**	-0.551*	-0.489*
	(0.00752)	(0.009)	(0.008)	(0.259)	(0.291)	(0.272)
# Fatalities during spring semester		0.00009			-0.00109	
		(0.00027)			(0.00783)	
# Fatalities during academic year			-0.00010			-0.00860
			(0.00020)			(0.00598)
Controls						
School fixed effects	x	x	x	x	x	x
Year fixed effects	x	x	x	x	x	x
# Exam fixed effects	x	x	x	x	x	x
Student characteristics	x	x	x	x	x	x
Schools	159	159	159	159	159	159
N (Students)	32,482	32,482	32,482	32,482	32,482	32,482

Notes: Standard errors reported in parentheses are clustered at the school level. Each column in each panel in the table represents a separate regression. Each observation is a student. In Columns 1–3, the dependent variable is a dummy variable that is equal to 1 if the student received a matriculation certificate. In Columns 4–6, the dependent variable is the matriculation composite score. In Panel A the independent variable in the first row is the intensity of exposure, calculated as the average of any fatalities from attacks occurring in the student's area during the four days before a matriculation exam across all exams taken by the student in the 12th grade. In Panel B the independent variable in the first row is the number of exams exposed to terror attacks causing more than five fatalities in the preceding four-day window. In each panel, the independent variable in the second row is total fatalities in the student's area during the spring semester when the student was in the 12th grade, and the independent variable in the third row is total fatalities in the student's area during the academic year when the student was in the 12th grade. All specifications include school fixed effects, year fixed effects, and fixed effects for the number of exams taken in the 12th grade as well as controls for student characteristics (gender dummy, both parents' years of schooling, number of siblings, a born-in-Israel indicator, and a set of indicators for ethnicity). The matched sample includes 32,482 12th-grade students in the regular Jewish state system who took matriculation exams in 2001–2005, comprising 16,241 students who were exposed to a fatal terror attack in the four-day window before at least one of their matriculation exams, and a matched group of 16,241 students from the same schools who took the same number of matriculation exams but who were not exposed to a fatal terror attack in the four-day window before any of their matriculation exams.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

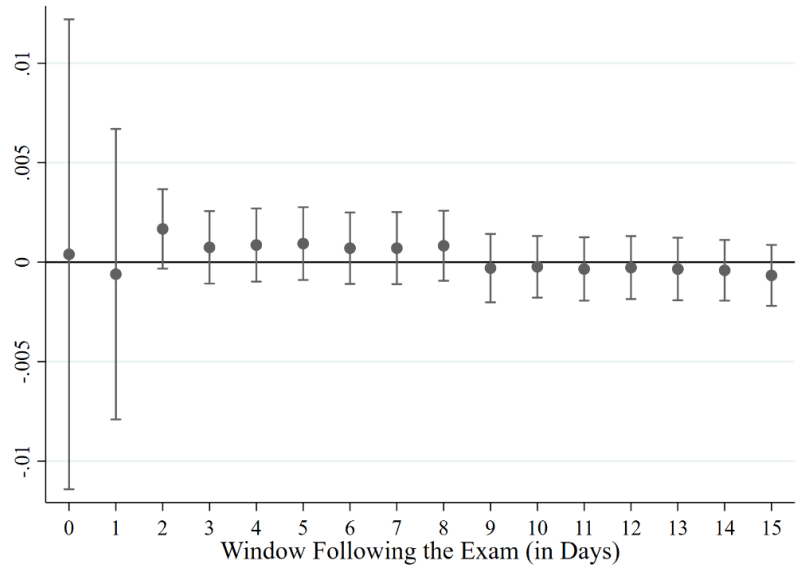

Figure A1

Effect of Terror Fatalities on Matriculation Score by Time Windows Following the Exam (Placebo Test)

Notes: The figure plots the coefficients and their 90 percent confidence intervals from specifications of Equation 1 where past fatalities ($t-j$) are replaced by future fatalities ($t+j$). Standardized matriculation exam scores are regressed on the number of Israeli fatalities from a terror attack in the student's area within the n-day window following the exam. Each specification allows for a different value of n from 0 to 15, where $n=0$ refers to the day of the exam but after the exam started. The regressions also include student-by-exam-period fixed effects, fixed effects for exam subject, fixed effects for proficiency level (for both the subject and the specific exam), and an indicator for a retake exam. Standard errors are clustered at the area and date level.

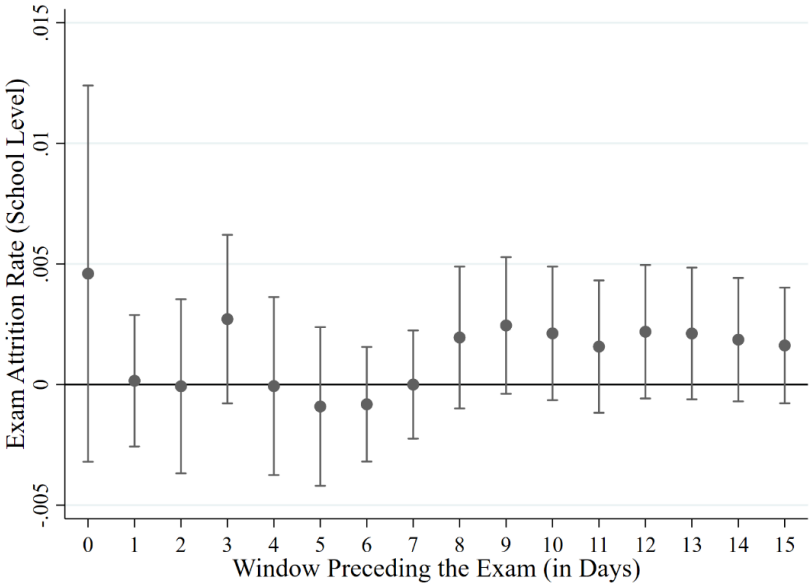

Figure A2

Effect of Terror Fatalities on Attrition Rate by Time Windows before the Exam

Notes: The figure plots the coefficients and their 90 percent confidence intervals for different specifications, where the rate of test-takers within a school by subject, exam proficiency level and date are regressed on the number of Israeli fatalities from a terror attack in the school's area within the n-day window before the exam. Each specification allows for a different value of n from 0 to 15, where $n=0$ refers to the day of the exam but before the exam started. The regressions include school-by-exam-period fixed effects, fixed effects for exam subject, and fixed effects for proficiency level (for both the subject and the specific exam). Standard errors are clustered at the area and date level.

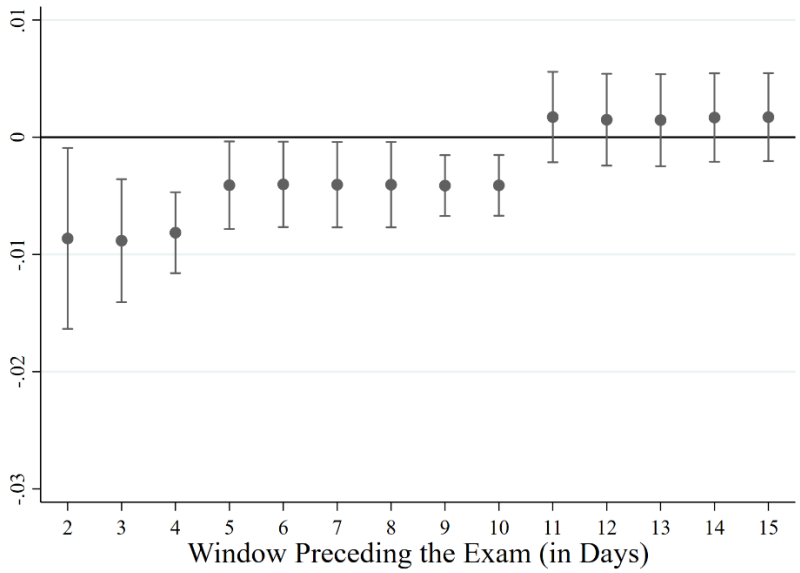

Figure A3

Effect of Cumulative Terror Fatalities on Matriculation Exam Scores by Time Windows—2001 Only

Notes: The figure plots the coefficients and their 90 percent confidence intervals from different specifications of Equation 1 while restricting the sample to include only students who took matriculation exams in the 12th-grade in 2001. Standardized matriculation exam scores were regressed on the number of Israeli fatalities from a terror attack in the student's area within an n-day window preceding the exam, with each specification allowing for a different value of n from 2 to 15, where $n=2$ refers to the two-day window before the exam. Results for $n=0$ and $n=1$ are not reported due to lack of variation: only 0.2% of the students were exposed to terror attacks within the two days before an exam in 2001. The regressions also include student-by-exam-period fixed effects, fixed effects for exam subject, fixed effects for proficiency level (for both the subject and the specific exam), and an indicator for a retake exam. Standard errors are clustered at the area and date level.