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Does moving from war zone change emotions and risk perceptions? A field study of Israeli students

Shosh Shahrabani* Uri Benzion† Mosi Rosenboim‡ Tal Shavit§

Abstract

The current field study uses data collected after the 2009 war between Israel and the Hamas militias in the Gaza Strip ended. The study compares recalled emotions and perceived risks among two groups of students, all of whom were exposed to rocket attacks. Individuals in the "left the war zone" group left the region under attack as a precautionary action, while the "stayed in the war zone" group remained in the region during war. The results indicate no significant differences in the levels of recalled fear and anger between the two groups, while the perceived self-risk from terror was higher among the "stayed in the war zone" group. Yet, a higher level of recalled fear was found among those who left the war zone and whose parents resided in the war zone, compared to those who left the war zone and whose parents resided outside the war zone. In addition, fearful people became more pessimistic about their level of personal risk from terror, but not about the routine risks. We conclude that civilians need attention even if they leave the war zone since leaving the attacked region as a precautionary action may mitigate perceived self-risk from terror but does not seem to eliminate the high level of negative emotions evoked by the terror attacks.

Keywords: risk perceptions, emotions, terrorism, optimism.

1 Introduction

The current research is a field study that uses unique data collected by a survey conducted one week after the 2009 war between Israel and the Hamas militias in the Gaza Strip (henceforth, "Gaza War") ended. The study examines recalled emotions and perceived risks, among students attending Ben-Gurion University in Be'er Sheva, which was exposed to rockets attacks for the first time in this war. The survey was conducted when the students returned to the university after a three-week break caused by the war.

The Gaza War between Israel and the Hamas militias lasted three weeks, from December 27, 2008 through January 17, 2009. The war erupted after eight years of frequent rocket attacks from the Gaza Strip on the southern region of Israel.[1] During the war, 800 rockets were fired into the southern region, killing three people, injuring 766 citizens and causing substantial damage to buildings and infrastructures (Amnesty International, 2009). The range of the rockets attacks expanded to encompass more of the southern region including Be'er Sheva, which was attacked for the first time at the time of the war. Therefore, all educational institutions and crowded public places in the area under attack were closed to prevent mass injuries.

The current paper follows several recent studies that have examined the ways in which people perceive risk and levels of negative emotions in the context of terrorist attacks and other calamities (for example see: Klar et al., 2002; Lerner et al., 2003; Fischhoff et al., 2005; Shahrabani et al., 2009; Benzion et al., 2009; Rosenboim et al., 2012; Maoz & McCauley, 2009; Skitka et al., 2006).

One of the major behavioral consequences of terrorism is precautionary behaviors that people use in an attempt to reduce their vulnerability. The more people feel that they are likely to be victims of a given risk, the more vulnerable they feel. According to the Health Belief Model (HBM),[2] perceived vulnerability to risk is one of the most

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*Department of Economics and Management, The Max Stern Academic College of Emek Yezreel, P.O. Emek Yezreel, 19300. Email: shoshs@gmail.com.

†Department of Economics, the Western Galilee College, Akko, Israel.

‡The Guilford Glazer faculty of Management, Department of Management, Ben-Gurion University, Be'er Shiva, Israel.

§The School of Business Administration, The College of Management Academic Studies, Rishon-Le'Zion. Israel.

[1] During the eight years between 2001 and 2008 (prior to the beginning of the Gaza War), over 8,000 rockets and 2,500 mortar shells were launched from the Gaza Strip into southern Israel. During the war, the Israel Defense Forces invaded the Gaza Strip.

[2] The HBM, developed by Rosenstock (1974), is a systematic method for explaining preventive behavior in terms of certain belief patterns. It has been adapted to explore a variety of preventive health behaviors (see Strecher & Rosenstock, 1997).

proximal cognitive variables related to precautionary motivations, intentions and behavior. This concept of vulnerability or risk perception, which ranges from "highly unlikely" (or zero probability) to "very likely" (or 100% probability), is used in all Health Belief Model studies (e.g., Weinstein, 1988).

Klar et al. (2002) examined the impact of perceived vulnerability and negative emotions on the precautionary behaviors of people in the context of terrorist attacks in Israel in 2001. Their results show that most participants reported some level of behavioral change and precautions against the threat of terrorism. Furthermore, negative emotions and perceived vulnerability were strongly related to precautionary behaviors such as limiting visits to public places (which people perceived as risky), limiting outings, and reducing bus travel. Hence, the findings of Klar et al. (2002) support the HBM prediction with respect to the impact of perceived vulnerability on precautionary behaviors. Rosenboim et al. (2012) used unique data from a natural experiment conducted in a college located in southern Israel that was exposed to rocket attacks in 2008. The study examined the relationships between negative emotions, perceptions of risk to oneself, precautionary actions and intentions of 290 students who were exposed to terror attacks while on campus. In addition, they compared emotions, risk perceptions and precautionary behavior between two groups: those who lived within range of the rockets and were also exposed to rocket attacks at home, and those who lived outside the rockets' range. The results reveal that those who lived outside the rocket area (and had less or no experience with terror attacks) were more likely to take precautionary actions during their stay on the campus, and were more pessimistic about continuing their studies at the college in the coming year than those living in the area, who had more experience with terror attacks.

Whereas past work examined the role of emotion in shaping behavioral responses including precautionary behaviors, estimates of risk and the different responses of groups threatened by terrorism and not imminently threatened by terrorism, the current paper emphasizes differences among threatened people as a function of how they chose to respond to the threat. In other words, the uniqueness of the current study is that it examines the differences in recalled emotions and risk perceptions among two groups of students who were all exposed to the terror attacks at the beginning of the war. The first group, "stayed in the war zone", includes students who remained in the attacked region during the war; the second group, "left the war zone", includes students who moved temporarily outside the rockets' range during the war as a precautionary action. Moreover, we examine each group according to where the students' parents reside (in the attacked region / outside the attacked region) to see whether this affected their emotions and risk perceptions. To the best of our knowledge, this type of comparison has never been conducted before.

This study has two objectives. First is to compare the recalled emotions and risk perception between those who took precautionary action and left the war zone, and those who "stayed in the war zone", in the attacked area. The second objective is to examine the relationship between negative emotions and risk perceptions about terror and routine risks. The results of the study may help us to better understand emotions and risk perceptions following the decision to stay or to leave a risky area during an acute event such as war.

The remainder of the paper is organized as follows: Section 2 describes the hypotheses; Section 3, methods; and Section 4, the major results. Finally, Section 5 summarizes the conclusions.

2 Hypotheses

In the current study, respondents were asked to estimate their personal risk from terrorism, the probability of catching the flu (as an example of routine risk[3]), and the risk that an average Israeli, living outside of the war zone, might experience a terrorist attack or catch the flu. In addition, respondents were asked to recall the levels of fear and anger they felt during the war. We divided our sample, which consisted of students from Ben-Gurion University (located in southern Israel), into two main groups: "stayed in the war zone" and "left the war zone".

Note that the participants in the "left the war zone" group were exposed to the attack at the beginning of the war, but left the area and were outside the rockets' attack range during most of the war. We also analyzed the two groups according to whether their parents resided in the attacked region or outside of it, since emotions and risk perceptions might be affected not only by the concerns about the self but also by the concerns for family. (For example: the fear level of those who left the attacked region and whose parents live in the same region might be higher than the fear level of those who left the attacked region and whose parents live outside the war zone).

2.1 Perceived risk

We expect that distance from the rockets' target zone will decrease the perceived self-risk from terrorism. This hypothesis is based on the findings of Fischhoff et al. (2003) that Americans in 2001 felt a greater personal risk from terror if they lived within 100 miles of the World Trade

[3]By using the risk of flu as an example of routine risk, we follow previous studies examining risk perceptions (e.g., Lerner et al., 2003; Benzion et al., 2009; Shahrabani et al., 2009).

Center than if they lived farther away. Our hypothesis is also based on Benzion et al.'s (2009) findings that people living within the range of rockets in northern Israel and exposed to rocket attacks during the 2006 Israel-Lebanon war had higher levels of perceived self-risk than those living in the center of the country, who were not at risk from the rocket attacks. Although the participants in the "left the war zone" group were exposed to the terror attack at the beginning of the war, most of the time they were outside the area. Therefore, our hypothesis is:

Hypothesis 1a: Participants in the "stayed in the war zone" group will have higher level of self-perceived risk from terror than those in the "left the war zone" group.

Regarding the perceived routine risk (in this study, the chance of coming down with the flu), we expect that the distance from rockets range will *not* affect perceived routine self-risk. This hypothesis is based on the gradient generalization hypothesis of Johnson and Tversky (1983) and on the empirical findings of Fischhoff et al. (2003) and Benzion et al. (2009). Fischhoff et al. (2003) found that, in mid-November 2001, respondents' place of residence was unrelated to their judgments of routine risks or of the risks faced by the average American. Benzion et al. (2009) found that there were no significant differences in the perception of routine self-risks and the estimation of routine risk to average Israelis of those who were exposed to rockets attacks during the 2006 Israel-Lebanon war and those who were not exposed to them. In other words, our hypothesis is:

Hypothesis 1(b): The perceived routine risk will be similar for the "stayed in the war zone" and the "left the war zone" groups.

In addition to the perceived self-risk, we examine the perception of risks from terror and flu to an average Israeli and it's relation to the perceived self-risk from the same events.

2.2 Relation between recalled emotions and perceived risks

Regarding the relationship between recalled emotions and risks, we expect that fearful people will express higher self-risk estimates about terrorism. This hypothesis, which refers to all participants (in both groups), is based on the "valence" approach (Johnson & Tversky, 1983; Wright & Bower, 1992) and the "appraisal-tendency" framework (Lerner & Keltner, 2000). Both maintain that fear leads to pessimistic risk perceptions. In addition, from a "risk as feeling" perspective (Loewenstein et al., 2001), fear is an affective determinant of perceived risk (Lerner & Keltner, 2001). As a result, emotions and risk judgments could vary together.

As for the emotion of anger, Lerner and Keltner (2001) found that, consistent with the appraisal-tendency prediction, when considering unambiguous events, angry individuals made estimates that were as pessimistic as were those of fearful individuals (compatible with the valance approach).[4] Since the war is perceived as an unambiguous event we expect that:

Hypothesis 2: Recalled fear and anger will be positively correlated with self-risk estimates about terror.

Yet, we do not expect that negative emotions will be correlated with perceptions of routine risks. Pham (1998, 2007) argues that intense emotions, whose source tends to be salient, are less likely to be misattributed. In our natural experiment, the source of the negative emotions experienced by the respondents was highly salient. Therefore, our hypothesis is:

Hypothesis 3: Recalled fear and anger level will not be correlated with perceptions of routine risks for both groups.

3 Methodology

3.1 Sample

The study's sample included 198 students from Ben-Gurion University, located in the region that was exposed to rockets fired from the Gaza Strip. During the war, the campus was closed for three weeks, therefore some of the students stayed in their rented apartments in Be'er Sheva (where the university is located) or in their families' homes in the attacked region. Other students left the attacked region and went to their parents' homes outside the southern region, or left the region to friends' homes or other safe places. Although we do not know the exact numbers, many students stayed in the southern region during the war (either because they did not have an alternative, or because they preferred to stay in their own apartments and maintain their "routine" lives as much as they could).

In our sample, the students in the "stayed in the war zone" group include those who remained in the southern region that was exposed to rocket attacks during the war (134 students, mean age 26.4, 66% males). Among the "stayed in the war zone" group, 118 students said that their families live in the war zone, while 16 students said that their families live outside the attacked zone.

The students in the "left the war zone" group (64 students, mean age 24.3, 61% males) moved outside the attacked zone during the war. Among this group, 36 students reported that their families live outside the war

[4] In Lerner and Keltner's (2001) study, experiments involving events in one's life were perceived as unambiguous with respect to certainty and control, if the events were clearly controllable and certain, such as brushing your teeth, or clearly uncontrollable and uncertain, such as earthquakes.

zone, while 28 reported that their families live in the attacked zone.

3.2 Design and procedure

The study was conducted at Ben-Gurion University, located in southern Israel. The questionnaire was distributed between January 28 and February 2, 2009, one week after students returned to class at the university after a break of three weeks because of the war. The questionnaire was distributed during class, and collected after about 30 minutes. Students could choose not to fill in the questionnaire but very few did. Part of the questionnaire was based on the questionnaire devised by Lerner et al. (2003), which was translated into Hebrew, retested, adapted to the Israeli situation, and validated in Benzion et al. (2009) and Rosenboim et al. (2012). The questionnaire (see Appendix) included items designed to measure the following:[5]

1. *Emotions:* recalled anger and fear were measured by a five-item Anger and Fear subscale (two for anger and three for fear). Respondents were asked to estimate on a scale of 1 to 7 the level of emotions they felt during the war (1—did not feel the slightest bit of emotion, and 7—felt very strong emotion).

2. *Perceived self-risk*: This measurement was based on the questionnaire measuring events that are risky for oneself (Lerner et al., 2003). Respondents were asked to estimate how likely it was that they would experience each of three risky events within the next 12 months. The anchors for these scales were 0% (the event is impossible) and 100% (the event is certain to happen). Two items concerned terrorism (e.g., "You will be hurt in a terrorist attack" and "You will have trouble sleeping because of the situation with terror"), and one item involved routine risk ("You will come down with the flu").[6]

3. *Average Israeli perceived risk*: Respondents were asked to estimate how likely it was that average Israeli living outside of the war zone would experience each of three risky events within the next 12 months. The anchors for these scales were 0% (the event is impossible) and 100% (the event is certain to happen). Two items concerned terrorism (e.g., "An average Israeli will be hurt in a terror attack" and "An average Israeli will have trouble sleeping because of the situation with terror"), and one item involved routine risk ("An average Israeli will come down with the flu").[7]

[5]The original questionnaire included questions about economic expectations, which we did not include in this paper.

[6]Nine participants did not answer one of the questions on self-risk of terrorism, and four participants did not answer the question regarding routine self-risk.

4 Results

4.1 Perceived risk and recalled emotions

Table 1 summarizes the mean values and the standard deviations (in brackets) for the emotions participants felt during war, perceived self-risks, and the perceived risks to an average Israeli living outside of the war zone. The recalled emotions of fear and anger were each measured as an average of all the relevant items on the questionnaire (consistent with Lerner et al., 2003 and Benzion et al., 2009). The Cronbach's alpha values for fear and anger were 0.91 and 0.87, respectively. Terror-risk was measured as an average level of the two items relevant to this risk in the questionnaire. The Cronbach's alpha for the terror self-risk and the terror Israeli-risk, were 0.62 and 0.78, respectively.

Univariate analysis of variance (ANOVA) was conducted with decision to remain in the war zone or to leave (stayed/left), and the parents' place of residence (in the war zone/out of war zone) for each one of the six measures in Table 1 as dependent variable. The decision to stay or leave was found to have a significant main effect on the estimated self-risk of being hurt by terrorism ($F(1,185) = 5.73$, $p = 0.01$, one tailed) and significant main effect on the perceived risk that an average Israeli would be hurt by terrorism ($F(1,190) = 3.55$, $p = 0.03$, one tailed)[8]. However, no significant effect was found for the other measures ($p>0.05$). The results in Table 1 show, that participants who stayed in the war zone exhibit higher levels of perceived self-risk from terror (consistent with hypothesis 1(a)), and in addition higher level of perceived risk to an average Israeli from terror than participants from the "left the war zone" group who took precautionary action. Although these results are compatible with previous findings that self-risk from terror was affected by the distance from the event (e.g., Fischhoff et al., 2003, regarding the events of September 11 and Benzion et al., 2009 about the 2006 Israel-Lebanon war), the circumstances in our research are different. Unlike previous studies which compared people who lived in the attacked area versus those who live far away, our participants from both groups were exposed to terrorism at the beginning of the war and one of the groups left the attacked region. This means that the duration of exposure

[7]Four participants did not answer one of the questions about an average Israeli's risk of terrorism, and three participants did not answer the question regarding the routine risk to the average Israeli.

[8]We used one-tailed test (Half-Tailed Tests in ANOVA) since we have a directional hypothesis regarding the effect of the decision to stay or to leave the war zone on the terror risk perception.

Table 1: Mean values and standard deviations for emotions during war and risks perception.[+]

Group	Anger*	Fear*	Perceived Self-risk from Terror (%)	Perceived Self-risk from Flu (%)	Perceived risk for the average Israeli from Terror** (%)	Perceived risk for the average Israeli from Flu** (%)
Stayed in the war zone Parents in war zone (n=118)	4.77 (1.76)	3.92 (1.98)	29.47 (24.32)	45.76 (30.84)	27.51 (23.30)	46.11 (31.66)
Stayed in the war zone Parents not in war zone (n=16)	4.88 (1.31)	3.67 (1.82)	23.66 (25.47)	36.41 (27.38)	23.91 (23.58)	40.63 (27.70)
Left the war zone Parents not in war zone (n=36)	4.63 (1.73)	3.27 (1.42)	11.85 (14.51)	39.68 (32.69)	19.56 (20.20)	45.91 (29.92)
Left the war zone Parents in war zone (n=28)	4.61 (1.61)	4.01 (1.48)	20.77 (20.41)	45.89 (35.23)	16.36 (18.35)	54.67 (34.08)

[+] Standard deviations in the brackets. *The scale response ranges from 1 (I did not feel the slightest bit of emotion) to 7 (I felt very strong emotion). ** An average Israeli who lives in central Israel and was not exposed to rocket attacks.

to the terror risk affects the perception of future risk. Although the participants in the "left the war zone" group were exposed to terror at the beginning of the war, they took precautionary action, left the war zone and were safe most of the time of the war.

Consistent with hypothesis 1(b), we did not find any significant differences in the perceived routine self-risk between those who stayed and those who left the war zone. In other words, we found no effect of distance from war zone on routine risk perception. These results are compatible with the findings of Fischhoff et al. (2003) that, in mid-November 2001, respondents' place of residence was unrelated to their judgments about routine risks or of the risks faced by the average American. Thus, there was no spillover from terror risks to other risks.

In addition, the ANOVA analysis reveals a main effect of parents' place of residence (in the war zone/out of the war zone) on estimated self-risk of being hurt by terrorism ($F(1,185) = 2.96$, $p = 0.04$, one-tailed), and no significant effect on the other measures ($p>0.05$). This means that, if parents' place of residence is in the war zone, the self-risk estimation from terror might take into account not only the self but also the immediate family risk from terror.

In addition, a t-test reveals a significantly higher level of fear ($t(62) = 2.04$, $p = 0.02$, one-tailed) and significant higher risk estimation to be hurt from terror ($t(54) = 1.83$, $p = 0.04$, one-tailed) for those who left the war zone and whose parents' reside in the war zone, compared to those who left the war zone and whose parents reside elsewhere. These results suggest that those who left the war zone and whose homes and families are in the war zone had no relief from their worries, because their relatives, homes and entire lives were still under attack. Although they had left the war zone physically, they did not leave the war zone emotionally.

4.2 Relation between recalled emotions and perceived risks

Table 2 summarizes the correlations between self-risk estimations (terror risk and flu risk, separately) and six variables, including recalled fear and anger levels, a dummy variable for being in the rockets' range (1= in the range, 0 = outside the range), a dummy variable for the parents' place of residence (1= in the rockets' range, 0 = outside the rockets' range), age, and a dummy variable for gender (0=female, 1=male).

We find significant positive correlations between recalled fear and anger separately, and estimations of personal risk, including terror risks and routine risks. We also find that females are more pessimistic than males, with respect to all types of risks, a result that is compatible with the findings of Fischhoff et al. (2003). Consistent with the results in Table 1, the distance from terror attacks and the parents' place of resident affects the

Table 2: Correlation coefficients: self-risk·*

The predictor	Terror risk to self	Flu risk to self
Anger	$\rho = 0.387^{++}$	$\rho = 0.165^{+}$
Fear	$\rho = 0.606^{++}$	$\rho = 0.204^{++}$
Rocket range (In=1)	$\rho = 0.257^{++}$	$\rho = 0.033$
Parents' place of residence (In=1)	$\rho = 0.228^{++}$	$\rho = 0.100$
Age	$\rho = 0.048$	$\rho = 0.090$
Gender (female= 0)	$\rho = -0.369^{++}$	$\rho = -0.239^{++}$

$^{++}$ $p < 0.01$, $^{+}$ $p < 0.05$ * The correlation coefficients critical value ($p = 0.05$) is 0.143.

self-risk from terror, but did not affect the risk perception about routine risk.

In addition, to identify the factors affecting risk perceptions (while controlling for all the other independent variables), Tables 3a and 3b summarize the results of two different OLS multivariate regression analyses. This analysis enables us to examine both the appraisal tendency theory (Lerner & Keltner, 2000) and the valence approach (Johnson & Tversky, 1983) while testing the relationship between negative emotions and risk perceptions in both groups. The dependent variables were estimations of personal risk, including terror risks and routine risks. The explanatory variables were the six variables we used in the correlation analysis in Table 2.

The results of the regression analysis in Table 3a show that the recalled emotion of fear is correlated with the perception of self-risk from terrorism (fearful people express pessimistic self-risk from terrorism), compatible with hypothesis 2. This result is supported by both the "valence" approach and the "appraisal-tendency" framework, which maintain that fear leads to pessimistic risk perceptions. Conversely, we did not find that recalled anger had a significant impact on perceived risk of terror in the regression analysis, a finding that is inconsistent with the part of hypothesis 2 dealing with anger. The recalled emotions of fear and anger did not affect the perceived routine risks in the regression analysis, which is compatible with hypothesis 3 and with the findings of Benzion et al. (2009) and Rosenboim et al. (2012). Consistent with the results in Table 1 the distance from terror attacks affects only the self-risk from terror, but did not affect the risk perception about routine risks consistent with the mean results in Table 1. We also find that females are more pessimistic than males, with respect to all types of risks, which is compatible with the results in table 2.

4.3 Perceived risk to an average Israeli

Table 4 summarizes the correlations between perceived risk to an average Israeli from terrorism and from routine risks, separately, and six variables, including perceived self-risk (from terror and from catching the flu, respectively), a dummy variable for being in the rockets' range (1 = in the range, 0 = outside the range), a dummy variable for the parents' place of residence (1 = in the rockets' range, 0 = outside the rockets' range), age and a dummy variable for gender (0=female, 1=male).

The results show that the perceived risk from terrorism to an average Israeli living outside the rockets' range is positively correlated with the self-risk from terror, while the perceived risk from catching the flu to an average Israeli is positively correlated with the self-risk from flu. Consistent with the results in Table 1, the distance from terror attacks is correlated with the estimations of perceived risk to an average Israeli from terrorism.

In addition, to identify the factors affecting risk perceptions to the average Israeli (while controlling for all the other independent variables), Tables 5a and 5b summarize the results of two different OLS multivariate regression analyses. The dependent variables were estimations of perceived risk to an average Israeli from terrorism and from routine risks. The explanatory variables were the six variables we used in the correlation analysis in Table 4.

The regression results show that the perceived risk from terrorism to an average Israeli living outside the rockets' range is positively correlated with the self-risk from terror, while the perceived risk from catching the flu to an average Israeli is positively correlated with the self-risk from flu (compatible with the results in Table 4). These results might suggest that the number the participant assigned to self-risk is used as an anchor number for perceived risk to an average Israeli, according to the anchoring and adjustment heuristic (Tversky & Kahneman, 1974). The anchoring and adjustment heuristic, refers to the tendency for decision-makers to be systematically influenced by salient, but not necessarily relevant, numbers (anchors) when making a numerical estimate (Tversky & Kahneman, 1974; Peters et al. 2006).

Table 3: Regression analysis.

Coefficients	Estimate	Std. Error	t (p)
a. Dependent variable: terror risk to self.			
Intercept	−15.40	8.63	−1.79 (0.08)
Anger	1.32	0.86	1.53 (0.13)
Fear	5.79	0.87	6.79 (0.00)
Rocket range (In=1)	10.74	3.23	3.32 (0.00)
Parents' place of residence (In=1)	1.68	3.38	0.50 (0.62)
Age	0.36	0.30	1.19 (0.24)
Gender (female= 0)	−9.77	2.93	−3.33 (0.00)
R-square = 0.462 , p = 0.00, *d.f.* = 187			
b. Dependent variable: flu risk to self.			
Intercept	12.89	15.04	0.86 (0.39)
Anger	1.72	1.50	1.15 (0.25)
Fear	1.16	1.50	0.78 (0.44)
Rocket range (In=1)	−1.33	5.45	−0.24 (0.81)
Parents' place of residence (In=1)	4.42	5.75	0.77 (0.44)
Age	0.98	0.52	1.88 (0.06)
Gender (female= 0)	−14.53	5.07	−2.87 (0.01)
R-square = 0.101 , p = 0.00, *d.f* = 192			

Note that we asked the participants to estimate the risk that an average Israeli living outside of the rockets' range would be hurt in a terrorist attack. It is reasonable that participants in the "stayed in the war zone" group exhibit higher level of perceived risk from terror for themselves but it is not reasonable that they would exhibit higher level of perceived risk from terror to an average Israeli outside the rockets' range. Since the self-risk from terror might be the anchor for the risk from terror for an average Israeli outside to rockets' range, we find that the perceived risk to an average Israeli is also higher for the "stayed in the war zone" group. Yet, another possible interpretation is that people differ in how they use the scale for risk; In other words, it could be that the scale they use for estimating self-risk is similar to the scale they use for estimating the risk for the average Israeli.

The regression analysis in Table 5b reveals that being in the rockets' range reduces the perceived risk that an average Israeli would come down with the flu. In other words, those who stayed in the rockets' range estimate a lower risk of the flu for an average Israeli in comparison to the estimation of those who left the attacked region.

One possible explanation could be that for those who stayed in the attacked region the perceived risk that an average Israeli would catch the flu may seem less important in comparison to the terror risk, while for those outside the attacked region this distinction between routine and terror risk is weaker. We did not find that the demographic variables, age and gender, have a significant effect on the dependent variables.

5 Discussion

In the current study, we used a data set from a field study conducted at Ben-Gurion University in southern Israel after the 2009 Gaza War. The contribution of our study to the existing literature is its comparison the effect of rocket attacks on the levels of emotion and perceived risks, among groups of people who all faced with the threat of terrorism but responded differently to that threat: those who stayed in the attacked region and those who left the region as a precautionary action.

The findings show that the levels of recalled emotions of fear and anger were not significantly different for "left the war zone" group that did not remain within the rockets' range and "stayed in the war zone" group that did. In addition, we found that the level of fear was significantly higher for those who left the war zone and whose parents resided in the war zone, compared to those who left the war zone and whose parents resided outside of the war zone.

Table 4: Correlation coefficients*: Average Israeli risk.

The predictor	Terror risk—average Israeli	Flu risk—average Israeli
Terror risk to self	$\rho = 0.489^{++}$	
Flu risk to self		$\rho = 0.868^{++}$
Rocket range (In=1)	$\rho = 0.185^{+}$	ρ = -0.064
Parents' place of residence (In=1)	$\rho = 0.087$	$\rho = 0.049$
Age	$\rho = 0.109$	$\rho = 0.066$
Gender (female= 0)	$\rho = -0.217^{++}$	$\rho = -0.211^{++}$

$^{++}$ $p < 0.01$, $^{+}$ $p < 0.05$ * The correlation coefficients critical value ($p = 0.05$) is 0.143.

Table 5: Regression analysis

Coefficients	Estimate	Std. Error	t (p)
a. Dependent variable: Terror risk to the average Israeli.			
Intercept	3.18	8.65	0.37 (0.71)
Self-risk from terror	0.43	0.07	5.96 (0.00)
Rocket range (In=1)	5.17	3.77	1.37 (0.17)
Parents' place of residence (In=1)	−4.80	3.82	−1.26 (0.21)
Age	0.49	0.34	1.44 (0.15)
Gender (female= 0)	−3.55	3.38	−1.05 (0.29)
R-square = 0.252 , $p = 0.00$, $d.f = 186$			
b. Dependent variable: Flu risk to the average Israeli.			
Intercept	11.38	6.79	1.68 (0.10)
Self-risk from flu	0.87	0.04	23.30 (0.00)
Rocket range (In=1)	−6.41	2.79	−2.30 (0.02)
Parents' place of residence (In=1)	0.26	2.93	0.09 (0.93)
Age	0.06	0.27	0.21 (0.83)
Gender (female= 0)	−0.11	2.48	−0.05 (0.96)
R-square = 0.761, $p = 0.00$, $d.f. = 192$			

We suggest it is possible that those who left their homes in the south as a precautionary action were more fearful and angry at the beginning of the war than those who stayed. The weakness of our data is that we use recalled emotions levels instead of emotions levels at real time. Moreover, another weakness is that we could not measure the fear and anger level of those who left the war zone at the beginning of the war. This means that there might be some selection bias in our study since those who left the rockets' range were naturally fearful and angry than those who stayed. Obviously, there is no real solution to this problem since we cannot predict when the war is going to start or who is going to leave the area as a precautionary measure. Nevertheless, our results show that those who left the attacked region to a safer place still suffer from high levels of negative emotions.

Our results suggest that leaving a risky area might stop the physical threat but does not change the negative emotions. However, our results do suggest that the perceived future risk from the same threat (terrorism in this study) is reduced by taking precautionary action (leaving the area). Therefore, one suggestion might be for policy-makers to encourage certain vulnerable citizens to leave the attacked region during war.

We found that recalled emotions are correlated to individuals' perception of risk from terrorism. Fearful people became more pessimistic about their level of personal risk from terrorism, but not from the routine risk. The first result, with respect to personal risk from terrorism, is compatible with both, the appraisal tendency theory (Lerner

& Keltner, 2000) and the valence approach (Johnson & Tversky, 1983), as well as other empirical findings.[9]

The second result, that negative recalled emotions evoked by the terror attacks do not affect the perception of routine risk, is compatible with previous findings that there was no spillover from risks of terrorism to other risks, because the source of the intense emotions was salient (e.g., Pham, 1998). Actually, it is conceivable that people perceive risks of terrorism differently than other risks, because terrorism differs in several important ways from the typical risks studied in the risk perception literature. Acts of terror are not caused by a natural source (like many diseases), rather they are *deliberately* designed to cause harm, pain, intimidation, and a sense of helplessness in the entire target group (Freedman, 1983; Klar et al., 2002).

Our main conclusion is that moving out from war zone as a precautionary action may mitigate individuals' risk perception about their risk from terrorism, but does not seem to eliminate the high level of negative emotions evoked by the attacks. In other words, geographical distance from the war zone does not always affect the negative emotions of those who were initially exposed to terrorism.

Our study focused on emotions and risk perceptions following the 2009 war between Israel and the Hamas militias. However, the southern region of Israel has been under ongoing terrorist attacks from the Hamas militias for more than 9 years. Because of this "routine emergency" in the region, all education institutions there have special psychological services units for their students/pupils. In addition, from 2007 several centers for treatment of psycho-trauma (called "resilience centers") were established in several cities and municipalities in the region, funded by the government and by voluntary funds, to treat people from the region who need the assistance of psychologists and social workers.

Therefore, we suggest that the support of psychotherapists and social workers aids should be extended not only to those who stay in the region, but also to civilians who leave the war zone as precautionary action and suffer from high levels of negative emotions.

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[9] See for example: Lerner et al. (2003) and Benzion et al. (2009).

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Appendix: The questionnaire

Part A: Emotions felt during the war

Likert-scale-type response options ranging from 1 (I did not feel the slightest bit of emotion during the war) to 7 (I felt very strong emotion during the war).

1. Angry, 2. Mad, 3. Worried, 4. Fearful, 5. Frightened.

Part B: Self-risky events

Participants entered probabilities ranging from 0% to 100%. "0" meant it was impossible that they themselves would experience such an event within the next year and "100" meant it was certain that they themselves would experience the event within the next year.

- You will be hurt in a terror attack.
- You will have trouble sleeping because of the situation with terror.
- You will get the flu.

Part C: Israeli risky events

Participants entered probabilities ranging from 0% to 100%. "0" meant it was impossible that an average **Israeli from out of the war zone** would experience such an event within the next year and "100" meant it was certain that average Israeli living outside of the war zone would experience the event within the next year.

- An average Israeli will be hurt in a terror attack.
- An average Israeli will have trouble sleeping because of the situation with terror.
- An average Israeli will get the flu.

Part D: Personal and demographic information

Gender _____ Age _____

Stayed at the attacked region during the war? Yes/No

Is your permanent place of residence at the attacked region? Yes/No