האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Federmann School of Public Policy and Government

Terrorism and Life Satisfaction:
The Case of the Religious and Secular Population in Israel

Thesis paper for M.A. in Public Policy

Advised by and Submitted to Prof. Claude Berrebi

Written by Shira Guedalia-Ephrat (304946106)

December 2016

Abstract

In this paper we analyze first a cross-sectional data set followed by a panel data set to identify the effect of terrorism on the life satisfaction of the population in Israel during the course of 12 years across districts. The analysis is based on data obtained from the Israeli Social Survey. We found that terrorism negatively affects the life satisfaction of the secular population while, in the aftermath of terrorism, the life satisfaction of the religious population increases.

Based on cross-sectional data we collected on a "Lone Wolf" terror wave, we found terrorism to have a negative but not significant impact on life satisfaction for the secular population, whereas for the religious population this relationship is positive and significant for up to two days. Moreover, the secular population attests to experiencing a decrease in life satisfaction during the "Lone Wolf" terror wave. In addition, we find the religious population to have more trust in the government and security forces in comparison to the secular population. Interestingly, other personal measures of fear were similar amongst the two populations.

Overall, our analysis provides strong empirical support that terrorism affects the life satisfaction of the population in Israel as a function of religious beliefs.

Acknowledgments

I would like to express my gratitude to my supervisor, Prof. Claude Berrebi, for his valuable and constructive mentoring during the planning and development of this research project. His supervision, advice, availability and resources have made this thesis possible.

Table of Contents

"What do you mean, why am I afraid? From the terrorists, from the rocks they throw,

from the hijacking, from it all" (Ochs, 2011)

Forward

This study belongs to the field of research which examines the relationship between terrorism and life satisfaction. Terrorism induces a paralyzing sense of fear among the affected population, a fear that he or she is likely to be the next victim of the attack. In its most fundamental form, terrorism is a psychological tactic that uses violence and particularly the threat of violence to create an atmosphere of fear and anxiety in more people than are directly affected by the acts themselves (Weinberg, Pedahzur & Canetti-Nisim, 2003). Terrorism's strategy is to damage the sense of personal security and cause a disruption of daily life, thereby affecting the ability of the targeted population to function. This strategy's objective is to motivate public opinion and to pressure decision makers to submit to the political demands of terrorists. Therefore, many questions arise around the subject of the influence of terrorism on civil society. In this study, we explore the impact of terrorism on the life satisfaction of the majority of the population (Jews) in Israel. Next, we present the literature background to this study which provides the basis for our hypothesis.

Terrorism - General Effect on Society and Individuals

As mentioned above, terrorism may affect life satisfaction though many channels simultaneously. The primary goal of terrorism is to instill a sense of fear and anxiety in its victims; hence, fear and trauma are direct outcomes of terrorism. Previous studies have shown that terrorism has many indirect outcomes, as well, that may even be larger in magnitude than the direct outcome of fear and stress (Becker & Rubinstein, 2004).

Economic Consequences of Terrorism

Previous research has found that terrorism affects economic aspects of life through its influence on various economic variables: foreign direct investments (Abadie & Gardeazabal, 2008), investment (Collier, 1999; Fielding, 2003b), the stock market (Abadie & Gardeazabal ,2003; Eldor & Melnick, 2004; Chen & Siems ,2004), foreign trade (Nitsch & Schumacher, 2004; Blomberg & Hess, 2006), national income and growth (Abadie & Gardeazabal, 2003; Bloomberg, Hess & Orphanides, 2004; Eckstein & Tsiddon, 2004), and tourism (Enders & Sandler, 1991; Fleischer & Buccola, 2002; Sloboda, 2003; Ito & Lee, 2005).

Other Effects on Society and Individuals

Economic consequences are only part of the overall costs and outcome of terrorism (Frey, Luechinger, & Stutzer, 2007). Terrorism has become a significant factor in our century in general and in the daily lives of the Israeli population in particular.

Terrorism affects a wide range of personal and national aspects of life including voters' behavior (Berrebi & Klor, 2006, 2008), fertility rates (Berrebi & Ostwald, 2015), the

labor force (Berrebi & Ostwald, 2014), the defense industry (Berrebi & Klor, 2010), and savings and consumption behaviors (Fielding, 2003a; Eckstein & Tsiddon, 2004).

Terrorism and Mental Health

In addition to the indirect consequences that terrorism may have on life satisfaction through any one or more of the channels mentioned above, terrorism has a direct effect on life satisfaction through fear and mental health.

The direct effect of terrorism on levels of fear and mental health has been recorded in various studies. These studies have found variations in the effect of terrorism on mental health over time and across segments of the populations.

It is unclear how long lasting the effect of a terror attack is on mental health. Schlenger, Caddell, Ebert, Jordan, Rourke, Wilson & Kulka (2002) found that one to two months following the events of September 11, probable PTSD was associated with direct exposure to the terrorist attacks among adults. Galea, Resnick, Kilpatrick, Bucuvalas, Gold, & Vlahov (2002) found that prospective evaluations of PTSD in trauma victims and in the general population after 9/11 suggest that the symptoms of PTSD decrease substantially within three months after a traumatic experience but that up to a third of cases of PTSD may not fully remit. However, it has also been found that even six months after the terrorist attacks on 9/11, posttraumatic stress symptoms amongst the U.S. population still remained elevated (Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). Boscarino, Figley & Adams (2003) examined the public's responses to future

terror attacks a year after 9/11 and found high levels of fear in NY area in comparison to the rest of the country.

Another question that arises when examining the consequences terrorism has on mental health is the effects of terrorism on those not directly involved in the attack. Galea et al. (2002) found that persons directly affected by disasters have higher rates of post-event psychiatric disorders than persons indirectly affected, yet those indirectly affected suffer as well. Schuster, Stein, Jaycox, Collins, Marshall, Elliott & Berry (2001) found that after 9/11 there is evidence that adults and children need not be present to have stress symptoms, especially if they consider themselves similar to the victims. Silver et al. (2002) conclude that the psychological effects of a major national trauma are not limited to those who experience it directly, and the degree of response is not predicted by objective measures of exposure to or loss from the trauma.

Studies have found a variation in the effect terrorism has on different segments of the population (Shalev, Tuval-Mashiach & Hada, 2004). Available literature on mass trauma suggests that certain factors may provide clues to identifying persons at greater risk for posttraumatic stress disorder (PTSD). The severity of the trauma and the accessibility of support systems may affect long term outcome across the population. Galea et al. (2002) found bivariate associations between the female sex and both PTSD and depression after 9/11. However, their models suggest that other factors may have been important mediators of the association between gender and psychopathology. Boscarino et al. (2003) found the level of public concern for future attacks after 9/11 to be significantly higher across the board among New York City and Long Island residents (downstate) compared to the rest of the state. A model predicting greater fear of terrorism indicated

that downstate residents, women, those 45 to 64 years old, African Americans and Hispanics, those with less education/income, and those more likely to flee, were more fearful of future attacks.

Studies conducted on the Israeli population found terrorism to have a varied effect on the population. Somer, Ruvio, Soref & Sever (2005) have found that terrorism influences PTSD. On the other hand Shalev, Tuval, Frenkiel-Fishman, Hadar & Eth (2006) found that a subgroup of those exposed developed serious symptoms, whereas others were surprisingly resilient. Bleich et al. (2006) assessed a range of psychological responses among various sectors of the population. Their findings suggest that known vulnerability factors such as gender, lack of education, immigrants and exposure to previous traumatic events contribute to a predisposition of terrorism-related distress. Significantly more TSRS (traumatic stress-related symptoms) were also found among participants who were religiously observant Jews.

In addition, in accordance with studies on 9/11, studies which found PTSD rates in Israel to be elevated in light of terror also found that the effect was not limited to direct victims of the attacks. Shalev et al. (2006) found the same levels of PTSD among two groups in two suburbs in Jerusalem with different levels of exposure to terrorism. They conclude that continuous terror created similar distress in proximal and remote communities and that exposure to discrete events was not a necessary mediator of terror threat. Somer et al. (2005) found that, although citizens residing in the most severely hit locales were also those who suffered most from post-traumatic symptoms, the effects of major national trauma were not limited to those directly exposed to it.

On the other hand, Romanov, Zussman & Zussman (2012) found that the correlation between happiness, stress, depression and sleeplessness and mental health was significant. But none of these assessments of happiness or mental health were significantly correlated with the intensity of terrorism.

A study done by Bleich, Gelkopf & Solomon (2003) on the psychological impact of ongoing terrorism in Israel concluded that considering the nature and length of the Israeli traumatic experience, the psychological impact can be considered moderate. Although the survey participants showed distress and a lowered sense of safety, they did not develop high levels of psychiatric distress, which may be related to a habituation process and to coping mechanisms.

In a follow up study, Bleich, Gelkopf & Solomon (2006) found the response of people in Israel after four years of terrorism to be diverse. Their results show that the Israeli society has coped with nearly four years of intense and continuous terror in a mixed manner, and suggests that, aside from possibly fostering habituation, continuous terror results in the erosion of resiliency.

The literature suggests that terrorism affects mental health, but this effect may vary across the population and even across cultures. The results amongst the Israeli population suggest that it is possible to overcome and adapt to the fear of terrorism, yet segments of the population suffer deterioration in mental health as a result of terrorism.

Terrorism and Behavioral Theories – Overcoming and Adapting

Kahnman & Tversky's (1979) prospect theory claims that people exaggerate the chance that an event with a small probability will occur and react more strongly to losses than to gains. Hence, based on this theory we would expect to find a significant effect of terrorism on life satisfaction. In addition, according to Becker & Rubinstein (2004) people behave according to their fear of terrorism and not according to the calculation of the risk they actually face. Hence, we would expect to find a significant effect of fear on life satisfaction. However, according to both these theories, it is also possible to overcome the fear of terrorism. Under prospect theory, fear may be overcome when one understands that the chance of a terrorist attack is less than they first believed. Under Becker & Rubinstein's (2004) model, fear can be overcome by being rational and training your mind. This may explain why the literature on terrorism and PTSD in Israel does not point to an unequivocal influence.

Israelis may be unusual in the sense that they have adapted and developed resilience to terrorism. Social resilience and moderate behavior adaptation has been found in Israel after the Second Intifada[1] (Friedland, Amit, Arian Fleischer & Kirschenbaum, 2005). Even more so, Elran (2006) claims that Israelis have managed to adjust to terrorism, even before the Second Intifada and the subsequent terrorist attacks.

On the other hand, it is possible that terrorism just does not have a lasting effect on life satisfaction. Kruger (2008) discusses the impact of terrorism through subjective well-

---

[1] Also known as the Al-Aqsa Intifada.

being and mental health. He asks whether terrorism has a lasting effect on life satisfaction or a passing one.

Psychological literature finds that even severe changes in people's lives tend to have only a transitory effect on their self-reported sense of well-being. Based on experience sampling data he obtained, Kruger demonstrates that on September 11th there was a large jump in reported sadness, but, within five days, it returned to the baseline level. In contrast, some phenomena have a permanent effect on life satisfaction, such as chronic pain or losing one's job.

Kruger (2008) concludes that fear of terrorism is due either to the lack of understanding of the actual risk or to peoples' inability to put that risk into contexts (in accordance with Kahneman & Tversky, 1979). "Terrorism, as we have experienced it so far, only matters in a big way if we let it matter" (P. 140). Terrorism causes uncertainty that in turn causes fear, but, after one time attacks, the uncertainty dissipates and does not have a lasting impact. The fear of terrorism, according to Kruger, is that it might escalate to a level at which it would pose catastrophic risk.

We can conclude from Kruger's analysis of the fear of terrorism that there is a difference between one time terrorist attacks and ongoing terror events which create constant fear of the next attack. Interestingly, in Israel, where the threat of terror during certain periods of time was constant, the literature points to resilience.

The studies mentioned above indicate that the direct effects of terrorism do not necessarily translate to a decrease in general life satisfaction. Terrorism may have an indirect effect on life satisfaction through the economy and other factors as mentioned

above. But the direct effect of terrorism, whose primary goal is to generate fear and cause trauma, may not be significant enough to effect life satisfaction.

Happiness and Life Satisfaction

Metrics for human well-being[2] may not be clearly defined; for example, happiness has not always been a policy goal. Stiglitz, Sen, & Fitoussi (2009) in their report discuss the need to shift the focus from GDP and economic measures to happiness and life satisfaction in regard to economic performance and social progress.

Stiglitz et al. (2009) identify measures that are better adapted to the measurement of the well-being of citizens in a country in a globalized world than GDP. They explain why governments should focus also on the sustainable well-being of the citizens of the country. Quality of life, for example, includes the full range of factors that make life worth living, including those that are not traded in markets and not captured by monetary measures. Thus, quality of life also has important implications for societal well-being. They conclude that metrics based solely on access to, or command over, resources are inadequate metrics for quality of life.

In the World Happiness Report (2012), various aspects of happiness and life satisfaction are discussed. Asking people whether they are happy, or satisfied with their lives, offers important information about society. These questions may signal underlying crises or hidden strengths. The authors explain that the case for taking happiness seriously is based on a belief, increasingly supported by evidence, that targeting happiness provides a

[2] For the purpose of this study well-being, life satisfaction and happiness are interchangeable.

broader range of possible ways to build a better world, including more effective solutions for poverty, illness and war.

The authors distinguish between various measures of subjective well-being. They claim that the primary distinction to be made is between cognitive life evaluations and emotional reports. Early modern attempts to classify different types of subjective well-being in psychology have also made a distinction between two types of emotional reports: positive effect (a range of positive emotions) and negative effect (a range of negative emotions). The primary distinction between life evaluations and emotional reports continues to be accepted today.

Veenhoven (2004) explains that happiness can be defined as 'quality of life' or 'well-being'. He describes four qualities of life: livability of the environment (welfare), life-ability of the person (how well we are equipped to cope with the problems of life), utility of life (higher value or meaning of life), and satisfaction with life. According to Veenhoven (2004), satisfaction with life represents the inner outcomes of life, the quality in the eye of the beholder. This quality is also known as subjective well-being, life satisfaction and happiness.

As mentioned in the World Happiness Report (2012): "the distinctive feature of happiness and other subjective well-being measures is that they offer people the chance to report on the quality of their own lives, reflecting their own histories, personalities and preferences. These are arguably the most democratic of well-being measures, since they reflect not what experts or governments think should define a good life, but instead represent a direct personal judgment" (P. 21).

In the 2016 World Happiness Report there is an attempt to obtain a better measure for subjective well-being. The authors claim that the standard life satisfaction question used in surveys is likely to suffer from serious problems of abstraction, complexity of calculus, and cultural bias. Abstraction depends on the scale; a 0–10 scale may prevent intuitive correspondence with verbal modalities. Complexity of calculus is caused by individuals intuitively weighting different sub-components (evaluation of past life, opportunities for the future, overall meaning of their own life, vitality, etc.). The general, abstract life satisfaction question incorporates much more noise and measurement error than a latent variable. Cultural bias depends on the fact that different linguistic nuances in the meaning of the term may enhance differences in answers across individuals from different countries which do not depend on true differences in life satisfaction[3].

Veenhoven (2004) explains that happiness can be measured by direct questioning and by one common question: "how satisfied are you currently with your life?" and that there is less of an issue when average happiness of a group is compared. He concludes that happiness of the great number can be raised and is significant enough of a value that we should try and do so. Therefore, policy making should aim to increase general happiness (Veenhoven, 2004).

The Life Satisfaction Function

In the 2012 World Happiness Report there is a list of the external and personal determinants of life satisfaction. Among the more "external" factors, key determinants of

---

[3] The issues raised in the 2016 World Happiness Report do not concern us. Our analysis is based on a 1-4 range which enables the respondent to associate a number with an adjective whose meaning can be grasped immediately. In addition, we do not have cultural bias since we do not compare life satisfaction across countries.

happiness include: income, work, community and governance, and values and religion. Among the more "personal" features, key determinants include: mental health, physical health, family experience, education, gender and age.

Previous studies have analyzed the significance and direction of the effect these variables may have on life satisfaction. Age was found to have a significant effect on life satisfaction that varies over the course of one's life (Blanchflower & Oswald, 2008; Goldbeck, Schmitz, Besier, Herschbach & Henrich, 2007; Mroczek & Spiro, 2005). Poor health was found to have a significant and negative effect on life satisfaction (Diener, Suh, Lucas, & Smith, 1999; Shields, & Price, 2005). Being female was found to have a significant and negative effect on life satisfaction (Graham & Shier, 2010; Senik, 2004; Romanov et al, 2012). Immigrants were found to be significantly less satisfied with life (Senik, 2014; Safi, 2010). Having children was found as well to have a significant negative effect on life satisfaction (Margolis & Myrskylä, 2011) although this effect may vary depending on the age of the child, marital and financial status. Marriage was found to have a positive significant effect on life satisfaction (Blanchflower & Oswald, 2011; Stutzer & Frey, 2006). Religion was found to have a significant positive effect (Ellison, 1991; Cohen, 2002). Education, as represented by a diploma was found to have a positive significant effect (Diener et al., 1999; Blanchflower, & Oswald, 2011) although this relationship has also been found to be negative (Baker, Cahalin, Gerst & Burr (2005). This contradiction can be explained by the fact that more educated people, on the one hand, have the tools for greater achievements, but, on the other, they have higher expectations and may become more frustrated. Income was found to have a positive significant effect on life satisfaction (Kahneman, & Deaton, 2010; Layard, Mayraz, &

Nickell, 2009). Lastly, vacation was found to have a positive effect on life satisfaction (Gilbert & Abdullah, 2004).

Terrorism and Life Satisfaction

Life Satisfaction as a Cost Function

In this study, we utilize the life satisfaction approach for capturing the cost of terrorism. The literature questions what metric is best to determine the effects of terrorism. Frey et al. (2007) try to capture the total cost of terrorism. They argue that the overall economic effect terrorism has does not capture the total costs since fear and grief are not part of the economic calculations. Therefore, the damage perpetrated by terrorism may be underestimated. They discuss methods for capturing total utility losses suffered as a result of terrorism. To measure the loss in utility, the authors described two common approaches, the stated preference method and the revealed preference method. They focus on whether the answers reflect a rational response to the terrorism risk.

They tested the stated preference method based on contingent valuation surveys. The subjects were asked what increase in the price of a plane ticket they would be willing to pay if the risk of a terrorist attack on an airplane were to be reduced by x% or to a "one in x per flight" chance. They tested the revealed preference method using the hedonic market approach (based on the housing and labor market), but this approach reveals future risk assessment rather than current risk. The other approach they suggested was the life satisfaction approach (LSA). This approach has several advantages over previous approaches: Firstly it does not rely on asking people how they value a public good.

Secondly, it is a less demanding task to state one's own current level of life satisfaction and therefore strategic responses are unlikely. Finally, the conditions needed for the hedonic market approach do not have to be met.

The Life Satisfaction Approach

Frey, Luechinger & Stutzer, (2009) use the LSA (Life Satisfaction Approach) to assess the cost of terrorism in utility and monetary terms. They view security or the absence of terrorism as a public good and approach the problem of assessing individual's preferences for this good. They explain that individuals have no incentive to disclose their true demands for non-excludable goods, and therefore, to overcome this issue in valuating public goods, they suggest the LSA. This approach correlates the degree of public good or public bad with individuals' reported subjective well-being and evaluates them directly in terms of life satisfaction, as well as relative to the effect of income on life satisfaction. This method is not based on observed behavior and solves the problems that can arise from asking individuals to value the public good directly. They conclude that under a list of assumptions reported, subjective well-being data can be used to assess individuals' preferences for public goods or externalities. However, there are a few limitations to the LSA that we will discuss in the methodological section of this study, including omitted variables, compensating variations and spatial resolution.

To test the theory, LSA Frey et al. (2009) used cross-section time-series data on terrorism and life satisfaction for France, the UK and the Republic of Ireland from 1973 to 2002. For each country, the authors estimated a separate happiness equation that included an annual measure of the intensity of terrorism in different regions (fatalities and incidence).

They found that terrorism reduced happiness; they estimate that a reduction in terrorist activity to a level that prevails in the more peaceful parts of the country, a resident of Northern Ireland would be willing to pay between 26% and 37% of his income, while a resident of Paris would be willing to forego between 4% and 8% of his income.

Their study is based on three regions per country to account for the diffusion of fear from terrorist attacks. In addition, they checked the identification based on a higher geographic resolution of the life satisfaction and terrorism data as well (13 for the British Isles, 21 for France) and found that highly disaggregated data persistently yield smaller estimates. Furthermore, they included economic situation variables (unemployment rate and growth rate of GDP per capita) to address simultaneity and to test whether terrorism affects life satisfaction through contemporary effects on the economy. Coefficients for both indicators of terrorism remained of similar magnitude when they controlled for business cycle effects. They concluded that neither does the course of the economy spuriously cause the negative correlation nor are the contemporaneous economic effects of terrorism an important channel through which terrorism affects life satisfaction. Frey et al. (2009) also tested the assumption that the effect of terrorism on life satisfaction is spurious by adding dummy variables for sub-groups of the population that are expected to suffer disproportionately from terrorism. The first group was the population living in rural areas who may be less affected then the population living in towns since terrorism often strikes in the city. The second group consists of agnostics and atheists since religiosity helps people cope. The third group was composed of Catholics who were at greater risk of being injured or killed. They found, as hypothesized, that rural area residence, agnostics

and Catholics were all more affected by terrorism, although the difference amongst the Catholic is less pronounced compared to the other subgroup effects.

A later study done by Romanov et al. (2012) studied the effect of terrorism on the happiness of Israelis during the Second Intifada. This study used detailed data on terrorism and on responses to a subjective life satisfaction question recorded in social surveys conducted in Israel from 2002-2004[4]. They obtained the date, time and location in which the survey interviews were conducted, which enabled them to link the daily data of the terrorism to the data from the survey. They used high- frequency data which allowed them to get a clean estimate of the immediate effect of terror attacks and allowed them to check the characteristics of the survey participants and the interaction with the effect of terror. They argued a direct and indirect effect of terrorism on happiness. The indirect effect is the terrorism-induced deterioration in economic circumstances. They control for the indirect effect by adding income and unemployment to the regression. In their results, they were unable to find that country- wide terrorism fatalities had a direct same day effect on life satisfaction of Jewish Israelis, and they did not find a delayed reaction either. For the Arab population, they found country- wide terrorism to have had a same day direct negative and significant effect (PV<5%) that lasted up to a week (PV<1%). However, when they tested same day reaction to civilian fatalities among Jews for attacks that took place in their own city, they found a negative and marginally significant (PV<10%) effect. They conclude that Palestinian terrorism in Israel during the intifada did not demoralize the majority of Israel's population.

---

[4] We conduct our analysis in Part I on an extension of this data base

These studies show that life satisfaction can be used to assess both the direct and indirect effect of terrorism. Both Frey et al. (2009) and Romanov et al (2012) found that specific populations were directly affected by terrorism.

Note, the magnitude of terrorism in Israel during the intifada was much higher than the magnitude in Frey et al. (2009) study. On the other hand, Romanov et al. (2012) have the disadvantage of a short study, and their results are limited to the events of the Second Intifada, with no other none terror time period for comparison.

Terrorism, Mental Health, Life Satisfaction and Religiosity

As mentioned above, terrorism does not affect all segments of the population equally when it comes to PTSD (Galea et al., 2002; Boscarino et al., 2003; Bleich et al., 2006).

Previous research in the field of psychology has found that religion is a coping mechanism, and the religious population may experience less PTSD in comparison to the secular population (Chen & Koenig, 2006; Gerber, Boals & Schuettler, 2011). In addition, research shows that the religion population is in general more satisfied with life (Chamberlain & Zika, 1988; Diener et al., 1999; Cohen-Zada & Sander, 2011; Fry, 2000; Lim & Putnam, 2010; Pargament, 2002; Diener & Clifton, 2002). This can be supported by Berman (2000) who found Ultra-Orthodox Jews in Israel and around the world to have much more extensive support networks than less observant denominations within Judaism since they supply mutual aid and social services.

Previous research has shown that religion facilitates the experience of positive emotions, promotes emotional well-being and thus helps to cope with terrorism (Fischer, Greitemeyer, Kastenmüller, Jonas, & Frey, 2006). These studies are mostly limited to U.S samples and have been performed using correlative designs. Fischer et al. (2006) study the impact of increased salience of terrorism on mood and self-efficacy of intrinsically religious and nonreligious populations. In a first hypothetical study done in Germany, the authors found that the probability of terrorism negatively affected only the mood of nonreligious participants. Their second study conducted in November 2003 after a suicide attack in Istanbul revealed that the mood of intrinsically religious participants was less negatively affected by conditions of high terror salience than was the mood of nonreligious participants. These findings suggest that religion helps cope with terrorism. However, their use of a cross-sectional design limits the results, and hence cannot detect cause and effect. In addition, their study is restricted to the German culture and Christian religion.

To summarize, previous studies demonstrate that terrorism negatively affects the victimized population through many external channels simultaneously. However, when trying to capture the direct effect (fear and trauma) studies from fields of psychological paint a more complex picture. Previous studies found terrorism to have a varying effect across the population. Furthermore, behavioral models claim that, on the one hand, people react disproportionally to fear and yet, on the other hand, they explain how this fear can be rationally overcome. In our study, we utilize life satisfaction which has been proven to be a reliable objective measure to examine and capture the overall direct and indirect effect terrorism has on the victimized population. Previous studies which focus

on capturing this effect through direct psychological aspects have found terrorism to have diverse effects across the population. However, the effect of terrorism on the life satisfaction of the religious and secular populations in Israel has not yet been studied. The theories listed above point to the variation in effect which terrorism may have on the life satisfaction across a population, and thus substantiates our hypothesis.

Hypothesis:

We hypothesize that terrorism has a varying effect on the life satisfaction of the Jewish population in Israel as a function of religion. More specifically, we expect to find a significant and negative effect for the secular population, while for the religious population we expect to find relatively more resilience.

The objective of this study was to first explore the effect terrorism has on the religious and secular population and then to study the effect of "lone wolf" terrorism on the population.

Part I: Terrorism and Life Satisfaction- Social Survey Analysis

The Central Bureau of Statistics (CBS) of Israel conducts an annualsocial survey. In this section, we analyze the effect terrorism has on life satisfaction based on data collected though this survey.

Romanov et al. (2012) did not find a significant effect of terrorism on life satisfaction among the total majority of the population in Israel (Jewish population). However, when we look more closely and divide the population by religious beliefs, we find that, amongst the secular population, the effect is significant and negative, while for the religious population we find the effect is positive and even significant.

The results of our analysis support our hypothesis; terrorism has a significant and negative effect on the secular population's life satisfaction. In contrast, for the religious population, our results may indicate that, not only does terrorism not have a negative effect, as a whole, but the population experiences an increase in life satisfaction in the aftermath of terrorist attacks in Israel.

The idea that terrorism can have a positive impact on the life satisfaction of the targeted population is surprising. However, we can begin to understand our results when we view them through certain perspectives. The first perspective provides that suffering can lead to meaning in life as is explained by Frankl's (1985) concept of Logotherapy. According to Frankel, the primary motivational force of an individual is to find meaning in life which can be achieved in three different ways: by creating a work or doing a deed; by experiencing something or encountering someone; and by the attitude we take toward unavoidable suffering. The second perspective is achieved by looking at religion as a

search for meaning as explained by Sacks (2012) "Science takes things apart to see how they work. Religion puts things together to see what they mean" (p. 2). Through these perspectives, we can understand that it is possible that, in the aftermath of terrorism, the religious Jewish population in Israel interprets the events in such a way that provides meaning to their lives and hence experience an increase in life satisfaction. This is supported by a growing field of research on post-traumatic growth, which is defined by Tedeschi & Calhoun (1995, 2004) as the experience of positive change that occurs as a result of the struggle with highly challenging life crises. They explain that in times of tragedy, religiosity and religious beliefs become potential moderators of the relationship between growth and distress (Hobfoll, Hall, Canetti-Nisim, Galea, Johnson, & Palmieri, 2007).

Next, we present the data, methodology and results, as well as additional robustness tests, for our study of the CBS social survey life satisfaction data.

Data

To analyze the effect of terrorism on life satisfaction, we constructed a cross-sectional data set followed by a panel data set consisting of demographic, economic data along with data on terrorism. Thisese data sets spans the years 2002-2013 across seven geographic districts.

Life Satisfaction Data

Life satisfaction data was obtained from the Central Bureau of Statistics which has conducted an annual life satisfaction survey since 2002 and has data available till 2013. The data consists of 7,000-7,600 sampled individuals per year over the age of 20. The

survey contains questions on sociodemographic and economic characteristics for the individuals. The survey does not track individuals over time, rather it consists of a different set of individuals for each year. The survey is conducted throughout the year and, therefore, individuals are sampled at different points in time. We requested from the CBS a variable that indicates the month[5] in each year that the questionnaire was filled out. This enables us to associate the reported life satisfaction with the respective events of terror and to analyze the effect on a monthly basis. For the purpose of this study, we used data only on the Jewish population in Israel (6,000 observations per year).

The life satisfaction question in the social survey is the main question of interest to our research. The question is as follows: Are you generally satisfied with your life?

There are four possible answers; very satisfied, satisfied, not so satisfied and not at all satisfied (ordinal variable on a 1-4 scale).

Additional variables of interest were chosen from the life satisfaction survey to best assess and control a range of demographic and social characteristics that the literature suggests influence life satisfaction as mentioned above.

What follows is a list of variables[6]: Age, Poor Health, Female, Immigrant, Children 0-5, Children 6-17, Married, Religious, Diploma, Salary[7], Trips and Ability to Cover Expenses.

---

[5] The data available on life satisfaction to the general public is yearly data. We received special permission to access monthly data; however we were not able to access the lower resolution data.

[6] See Table of life satisfaction data variables Appendix 1.

[7] We chose to use salary although it is less commonly used in the literature in comparison to income since the data consist of missing observations for both variables. We found that the missing observations for salary regarded individuals in their early twenties and late 60's and up, an age at which unemployment is high and therefore we were able to replace those missing observation with the value '0'.

The life satisfaction survey consists of a consistent and representative sample for the religious and secular population (Figure 1). The percent of the religious population sampled varies across districts, and only very slightly over time. Judea and Samaria is the district with the largest religious population (51%) followed by the Jerusalem district (46%). The South, Tel Aviv, Center and Northern districts have a similar percent of religious population (~14%) while in the Haifa district there is the smallest percent of religious population (8%).

Figure 1: Percent of religious population as a function of time and across districts:

District

% Religious Population	Jerusalem	North	Haifa	Center	Tel Aviv	South	Judea & Samaria
2002	41%	13%	8%	12%	14%	13%	41%
2003	40%	11%	9%	11%	13%	13%	45%
2004	49%	7%	6%	13%	13%	14%	55%
2005	43%	12%	8%	13%	11%	14%	43%
2006	39%	16%	8%	15%	12%	15%	35%
2007	49%	14%	7%	12%	14%	15%	59%
2008	43%	13%	6%	13%	14%	16%	59%
2009	46%	14%	9%	16%	14%	19%	71%
2010	50%	12%	7%	16%	13%	15%	49%
2011	51%	13%	8%	15%	13%	16%	54%
2012	52%	13%	9%	14%	15%	15%	49%
2013	49%	14%	8%	15%	14%	16%	58%
Average	46%	13%	8%	14%	13%	15%	51%

In Figure 2 we present summary statistics for the survey variables of interest. We can see that the average life satisfaction for the entire population is 3.1, and ranges from 1 to 4. The statistics for children show that 26% of the population has children between the ages of 0-5, while 36% have children between the ages of 6-17. The average age group of the

population is between 40-44. On average, the level of the highest education received is most similar to a certificate of completion of a post-secondary school that is not an academic certificate. The average monthly salary is in the range of 4,000-5000 NIS. The rest of the statistics show that 36% of the sampled population reported having poor health, 33% have taken trips outside the country in the last year, 63% are married, 42% are immigrants, 51% are females and 30% of the population is religious.

Figure 2: Summary statistics - social survey variables

Variable	N	Mean	SD	Min	Max
Life Satisfaction	71,053	3.153	0.715	1	4
Children 0-5	71,411	0.265	0.441	0	1
Children 6-17	71,411	0.364	0.481	0	1
Age	71,409	5.676	3.246	1	11
Diploma	62,612	2.714	1.413	0	6
Poor Health	71,265	0.364	0.481	0	1
Trips	71,346	0.330	0.470	0	1
Married	71,411	0.635	0.482	0	1
Immigrant	71,411	0.420	0.494	0	1
Female	71,411	0.519	0.500	0	1
Religious	71,411	0.309	0.462	0	1
Salary	52,553	4.578	3.425	0	10
Ability to Cover Expenses	64,662	2.612	0.847	1	4

Economic data

Data on the percent of the population receiving income support is included in our analysis to control for the effect of the economy on life satisfaction. Data on economic variables for each locality on a yearly basis was obtained from the CBS[8]. We grouped the data by

---

[8] http://www.cbs.gov.il/ishuvim/ishuvim_main.htm

district and conducted a linear extrapolation to estimate the monthly changes. The data spans over the years 2002-2013 and across the seven districts.

Figure 3: Summary statistics - economic data

Economic Variable	N	Mean	SD.	Min	Max
Percent of the population receiving income support	1008	0.051132	0.034118	0.012809	0.139568

Data on terrorism

The data on terrorism is based on the data used by Berrebi & Klor (2008) and contains daily information on every terror attack that caused the death of at least one Israeli noncombatant[9]. We have updated the terrorism data up until 2013 to match the available data on life satisfaction. In addition, location specific variables for each terror attack were added to the data as well as a location variable regarding the origin of the victims from each attack. Information was collected from the MFA archive[10] and missing information was filled though various news articles.

Our data includes three variables which are used to measure terrorism: the number of attacks within a district, the numbers of casualties who were killed physically **within** a respondents district (casualties within a district), and the number of casualties **from** the

---

[9] This study uses the United States Department of State's definition of terrorism:
The term "terrorism" means premeditated, politically motivated violence perpetrated against non-combatant targets by subnational groups or clandestine agents;
The term "non-combatant", is interpreted to mean, in addition to civilians, military personnel (whether or not armed or on duty) who are not deployed in a war zone or a war-like setting.
[10]http://mfa.gov.il/MFA/ForeignPolicy/Terrorism/Palestinian/Pages/Victims%20of%20Palestinian%20Violence%20and%20Terrorism%20sinc.aspx

respondent's district, including those who were killed in a different district[11] (casualties from district). The number of casualties refers to the number of fatalities and does not include those who were not fatally injured in the attacks.

Figure 4: Summary statistics - terror data variables

Terror Variables	N	Mean	SD	Min	Max
Casualties in district	1152	0.802951	3.055278	0	33
Casualties from district	1152	0.50434	2.020739	0	21
Attacks	1152	0.269097	0.801053	0	9

In Figure 4 we present summary statistics for the terror data. Our data consists of 1,152 observations which represent 12 months in 12 years across 8 districts. The reason we have an additional 8th district is to capture the casualties in the Gaza Strip (Gush Katif) where Israeli civilians lived up until 2005. We do not have life satisfaction data available for this 8th district, but we include the casualties in this district in our calculations for the number of casualties from other district. This way, a casualty originally from another district that was killed in a terror attack in the Gaza Strip is accounted for.

Looking at Figure 5 which contains a summary of terrorism variables for each district throughout the years, we can see that not all years or districts experience equal amounts of terror. The year 2002 was a year with significantly more terror attacks and fatalities, 102 attacks with 395 fatalities within the district which is significantly larger compared to

---

[11] To calculate this variable we created an 8th fictitious district to represent the fatalities in the Gaza strip (and what used to be called Gush Katif) up until 2005. Although we do not have life satisfaction data available for these locations we use the information on terrorist attacks within the 8th district to calculate the number of casualties *from* a different district.

the following year (2003) that had the second most amount of terrorism, with 48 attacks and 189 fatalities across all district.

Throughout our sample, the most terrorist attacks take place in the district of Judea and Samaria (96), followed by the Southern district (57) and the district of Jerusalem (44). The largest number of fatalities experienced within a district was in the Jerusalem district (195). We can see from the data that the distribution of attacks across districts and over time is sporadic. Locations may suffer from terrorism at one period of time but not at another. This allows us to compare terrorism over time and across districts to analyze the effect terrorism may have on the life satisfaction of the population.

Figure 5: Terrorism as a function of time and across districts:

* The number of casualties refers to the number of fatalities and does not include those who were not fatally injured in the attacks

	Jerusalem			North			Haifa			Center			Tel Aviv			South			Judea & Samaria			Gaza Strip			Total	
	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Casualty in District	# Attacks	Casualty From District	Killed	Attacks
2002	90	18	59	46	6	22	51	7	34	58	9	30	16	5	8	12	7	3	108	43	71	14	7	4	395	102
2003	59	7	41	7	5	6	39	3	34	18	7	8	27	3	17	7	3	3	26	18	14	6	2	0	189	48
2004	24	6	19	0	0	0	0	0	0	0	0	0	4	2	4	38	8	29	8	8	5	22	11	8	96	35
2005	3	3	1	1	1	1	8	2	6	11	3	8	5	1	1	11	5	7	9	5	6	7	5	4	55	25
2006	2	2	1	49	18	34	16	6	16	0	0	0	13	3	4	6	4	6	8	5	6	0	0	0	94	38
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	4	4	3	4	0	0	0	9	6
2008	14	5	6	0	0	0	0	0	0	2	1	1	0	0	0	14	12	13	0	0	0	0	0	0	30	18
2009	0	0	0	2	2	2	0	0	0	1	1	0	0	0	0	1	1	1	4	3	4	0	0	0	8	7
2010	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	6	3	4	0	0	0	9	6
2011	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	12	5	4	9	4	7	0	0	0	23	11
2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	6	4	0	0	0	0	0	0	9	6
2013	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	2	2	2	4	4	2	0	0	0	8	8
Total	195	44	127	107	34	67	114	18	90	90	21	47	66	15	35	118	57	76	186	96	123	49	25	16	925	310

Descriptive Statistics

In this section we describe the data on terrorism and life satisfaction for the religious and secular population. This allows us to view trends in the data which go hand in hand with our regression analysis.

When we look at the average life satisfaction across districts for the whole population, (Figure 6) and the religious and secular population separately, we can see that, on average, the secular population has less life satisfaction. The district with the highest average life satisfaction is Judea & Samaria (3.39) followed by district of Jerusalem (3.3). Moreover, the religious populations in the districts of Jerusalem and Judea & Samaria have the highest average life satisfaction, 3.49 and 3.5 respectively. Noteworthy, these two districts experienced the most significant number of fatalities as a function of time as seen above in Figure 5.

Figure 6: Average life satisfaction by population (2002-2013)

Average Life Satisfaction 2002-2013

District	Whole Population	Religious	Secular
Jerusalem	3.3057	3.4935	3.1341
North	3.1723	3.3680	3.1427
Haifa	3.1001	3.2666	3.0845
Center	3.1647	3.3153	3.1399
Tel Aviv	3.1240	3.3591	3.0836
South	3.1059	3.2977	3.0700
Judea & Samaria	3.3922	3.5061	3.2258
Average	**3.1950**	**3.3723**	**3.1258**

Next we present graphs of terrorism and life satisfaction as a function of time (Figure 7). We can see that, as a whole, the life satisfaction of the Israeli population has increased while terrorism has decreased. Since the starting point of our sample is the period of time with the highest rates of terrorism, we do not know if the increase in life satisfaction is within the boundaries of a natural incline of life satisfaction or whether it is due to the decrease in terrorism over time. When we look at the fluctuations in the life satisfaction of the religious and secular population in light of terrorism, we can see that, when terrorism increases, the life satisfaction of the secular population decreases while the life satisfaction for the religious population increases. For example, if we look at the data for July 2006, there was a sudden increase in terrorism, followed by a decrease in the average life satisfaction for the secular population and an increase in life satisfaction for the religious population.

Figure 7: Religious & Secular Life Satisfacton as a function of Terrorism
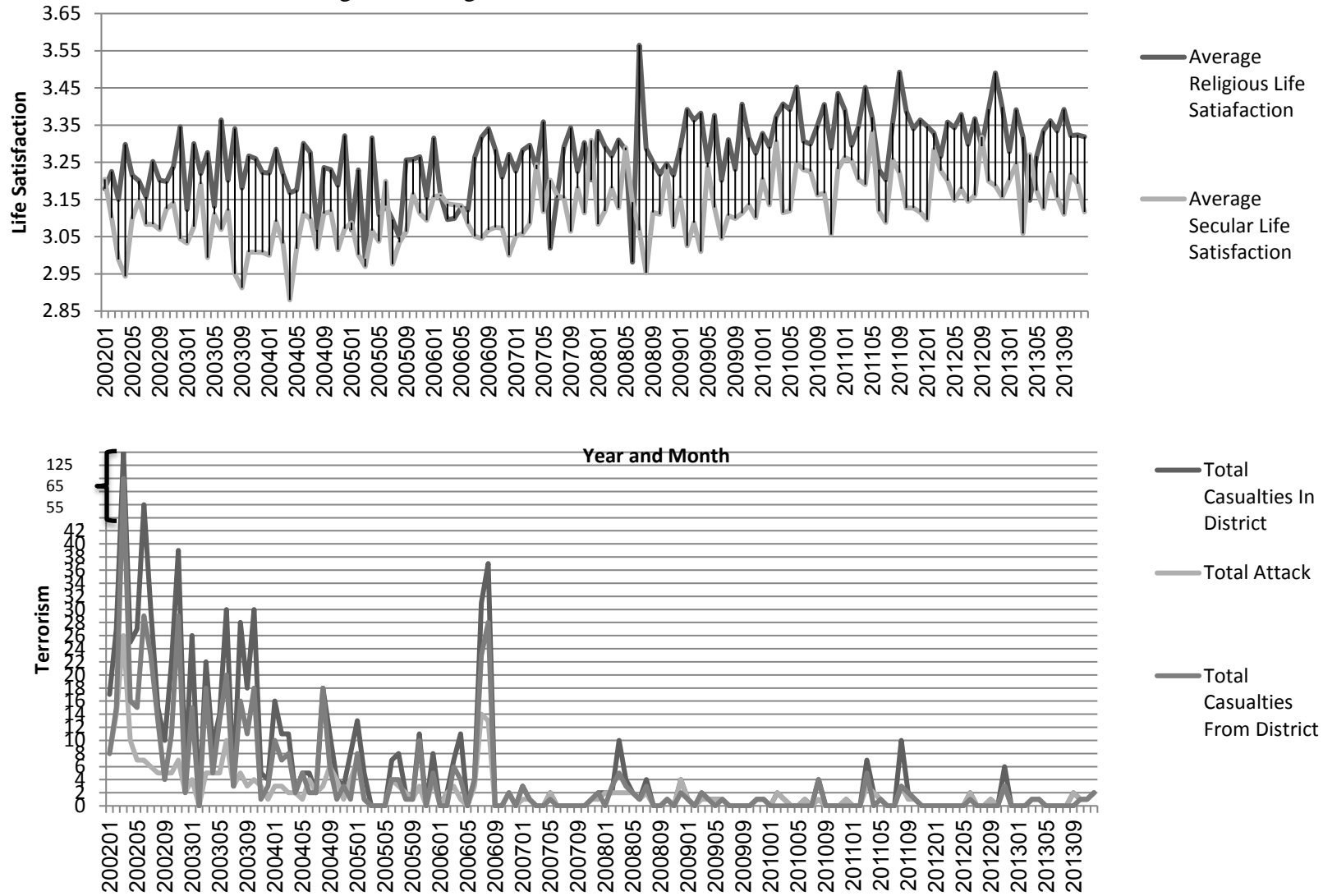
Empirical Strategies and Results

This section describes various empirical strategies used to identify first, a correlative effect and then a causal effect of terrorism on life satisfaction of the religious and secular populations. Our analysis employs multiple specifications which vary by the control variables included in each specification, and by measures of terrorism.

Cross Section Data: Analysis at the Individual Level

Methodology

The CBS does not track the life satisfaction of individuals over time which limits us to a cross-sectional analysis when we analyze the data at the individual level. In the cross-sectional model, we check the correlation between terrorism and life satisfaction, but we are unable to isolate the effect. The cross-sectional model limits us since there may be other causes for the change in life satisfaction which we cannot identify or isolate. For example, economic changes may occur around terrorist attacks and affect the life satisfaction of the population in a given district that experiences terrorism. Therefore, in a cross-sectional model, we do not have the ability to prove a causal effect, and we are limited to correlational results. We later test our hypothesis further on a panel data set to show causality.

Empirical results

We estimated the following OLS model with a logarithmic transformation[12]:

---

[12] We chose to use a logarithmic model for our analysis; thus, a one point change in terrorism, another casualty, will bring to a 100*β% change in life satisfaction.

$$\ln(\text{Life Satisfaction})_i = \alpha + \beta(\text{Terror Variable Previous Month})_d + \gamma X_i + \delta \text{Year} + \lambda \text{District} + \varepsilon_i$$

Where $(\text{Life Satisfaction})_i$ is a given individual i life satisfaction on a 1-4 scale as described above. α is the intercept. $(\text{Terror Variable Previous Month})_d$ refers to either one of the two terror variables which were each used in a separate regression to estimate terrorism. The terror variable in the regression is for one month prior to the month in which individual i was sampled. X_i is a vector of demographic and economic control variables for individual i as used in previous studies and described above. Year is a set of indicator variables for each year in the sample to control for yearly changes and that effect life satisfaction. District is a set of indicator variables for each district employed to control for district specific characteristics which affect the population's life satisfaction. ε_i is the random error for individual i.

We use two variables individually to measure terrorism: The numbers of fatalities who were killed **within** the geographic boundaries of an individual's district (casualties **within** district) and the number of fatalities who originated **from** the district of an individual (casualties **from** district) who were not necessarily killed in that district. We chose to run our analysis using both these variables since it is unclear which one is more significant when we test the effect terrorism has on the population's life satisfaction. There is no reason to believe one index should be a better proxy to estimate the effect of terror then the other, so we use both throughout our analysis. We lag the terrorism variable one time period behind (one month) to better address endogeneity concerns.

To test the effect of various variables on life satisfaction, we utilize the standard baseline regression developed and widely accepted in the happiness literature. Romanov et al. (2012) utilized the following control variables when they tested for the effect of terrorism on life satisfaction: gender, age, marital status, kids, education, health, religion, immigrant status, income and unemployment. Income and unemployment were utilized to control for the indirect effect of terrorism on life satisfaction thorough the economy. Frey et al. (2009) employed macro-economic variables to control for the effect the terrorism has on the economy. We chose the percent of the population who receive income support within the respondent's district to control for macro-economic changes within the district.

From Table 1, we can see that the significance and direction of the effect the individual control variables have on life satisfactions are consistent with the existing literature. Age, poor health, being a female, and having children have a significant and negative effect on life satisfaction, while marriage, religion, education (Diploma), salary and vacation (Trips) have a significant and positive effect on life satisfaction. The percent of the population receiving income support in an individual's district has a negative but does not have a consistently significant effect on life satisfaction

Table 1 displays the estimation of the effect terrorism may have on the life satisfaction of the total population. We found a significant but very small correlation between terrorism and life satisfaction. This correlation stands true for both proxies of terrorism: the coefficients are -0.001 (PV<5%) and -0.0016 (PV<.1%) for the number of casualties **within** and **from** the respondents' district accordingly.

Table 1: Entire Population

	1	2	3	1	2	3
		Dependent Variable: Ln(Life Satisfaction)				
Casualties Within District (Last month)	-0.0007*	-0.0007*	-0.0010*			
	[0.0003]	[0.0003]	[0.0004]			
Casualties From District (Last month)				-0.0015**	-0.0015**	-0.0016**
				[0.0005]	[0.0005]	[0.0006]
Age	-0.0089***	-0.0097***	-0.0058***	-0.0089***	-0.0097***	-0.0058***
	[0.0004]	[0.0004]	[0.0005]	[0.0004]	[0.0004]	[0.0005]
Poor Health	-0.0991***	-0.0997***	-0.0654***	-0.0991***	-0.0997***	-0.0654***
	[0.0023]	[0.0023]	[0.0026]	[0.0023]	[0.0023]	[0.0026]
Married	0.0871***	0.0927***	0.0713***	0.0871***	0.0927***	0.0713***
	[0.0021]	[0.0023]	[0.0027]	[0.0021]	[0.0023]	[0.0027]
Female	-0.0129***	-0.0124***	-0.0046+	-0.0129***	-0.0124***	-0.0046+
	[0.0020]	[0.0020]	[0.0023]	[0.0020]	[0.0020]	[0.0023]
Immigrant	-0.0613***	-0.0618***	-0.0658***	-0.0613***	-0.0618***	-0.0658***
	[0.0023]	[0.0023]	[0.0026]	[0.0023]	[0.0023]	[0.0026]
Religious	0.0289***	0.0301***	0.0501***	0.0289***	0.0301***	0.0501***
	[0.0022]	[0.0022]	[0.0027]	[0.0022]	[0.0022]	[0.0027]
% Population Receiving Income Support in District		-0.3187*	-0.2377		-0.3301*	-0.2422
		[0.1328]	[0.1527]		[0.1329]	[0.1528]
Children 0-5		-0.0173***	-0.004		-0.0173***	-0.004
		[0.0027]	[0.0030]		[0.0027]	[0.0030]
Children 6-17		-0.0044*	-0.0076**		-0.0044*	-0.0076**
		[0.0022]	[0.0025]		[0.0022]	[0.0025]
Diploma			0.0035***			0.0035***
			[0.0008]			[0.0008]
Trips			0.0569***			0.0569***
			[0.0024]			[0.0024]
Salary (Working Population)			0.0034***			0.0034***
			[0.0004]			[0.0004]
_cons	1.1796***	1.2032***	1.1315***	1.1803***	1.2045***	1.1314***
	[0.0055]	[0.0093]	[0.0112]	[0.0055]	[0.0093]	[0.0111]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	70715	70715	45969	70715	70715	45969
adj. R^2	0.122	0.123	0.123	0.122	0.123	0.123

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets. Data set: cross-sectional data for the entire population.

Religious versus Secular Populations:

Taking a closer look, we examined the different effect terrorism may have on the religious and secular populations. We estimate the effect by using an interaction variable for terrorism and the religious population as can be seen in Table 2. The model estimated was an OLS model with a logarithmic transformation:

ln(Life Satisfaction)$_i$ = α + β_1(Terror Variable Previous Month)$_d$ + β_2(Terror Variable Previous Month)$_d$*(Religious)$_i$, + γ(Religious)$_i$ + δX_i + λYear + ρDistrict +ε_i

This model is similar to the model used for Table 1 aside from (Religious) which is an indicator variable (1 for the religious population) and the additional inclusion of an interaction term between Religious and the terror variable. Including an interaction term of terrorism with an indicator variable for population (Religion) enables us to isolate the effect terrorism has on each population. When we look at the life satisfaction for a secular individual (Religious=0), the effect of terrorism on life satisfaction is β_1. while for the religious population, the effect of terrorism on life satisfaction is β_{1+} β_2.

Table 2 displays the results for the estimated effect of terrorism on the life satisfaction of the religious and secular population at the individual level. The results show a statistically significant negative effect of terrorism on the secular population. For the number of casualties **within** the respondent's district the coefficient is equal to -0.0014 while for the number of casualties **from** the respondent's district the coefficient is equal to -0.0022, both are significant at the 1% level. In addition, the results indicate that terrorism has a different effect on the religious population. The coefficient for the interaction of terrorism and religion is positive for both terror variables and marginally significant (0.0016 PV<10% for Casualties **within** District and 0.0025 PV<10% for Casualties **from** District).

The significance and direction of the effect the control variables have on life satisfaction are similar to those in Table 1.

Table 2: Religious VS Secular Population

Dependent variable: Ln(Life Satisfaction)

	1	2	3	1	2	3
Casualties Within District (Last month)	-0.0010*	-0.0010*	-0.0014**			
	[0.0004]	[0.0004]	[0.0004]			
Religious* Casualties Within District (Last month)	0.0009	0.0009	0.0016+			
	[0.0007]	[0.0007]	[0.0008]			
Casualties From District (Last month)				-0.0022***	-0.0023***	-0.0022**
				[0.0006]	[0.0006]	[0.0007]
Religious* Casualties From District (Last month)				0.0025*	0.0024*	0.0025+
				[0.0011]	[0.0011]	[0.0013]
Age	-0.0089***	-0.0097***	-0.0058***	-0.0089***	-0.0097***	-0.0058***
	[0.0004]	[0.0004]	[0.0005]	[0.0004]	[0.0004]	[0.0005]
Poor Health	-0.0991***	-0.0997***	-0.0654***	-0.0991***	-0.0997***	-0.0654***
	[0.0023]	[0.0023]	[0.0026]	[0.0023]	[0.0023]	[0.0026]
Married	0.0871***	0.0927***	0.0712***	0.0871***	0.0927***	0.0712***
	[0.0021]	[0.0023]	[0.0027]	[0.0021]	[0.0023]	[0.0027]
Female	-0.0129***	-0.0124***	-0.0046+	-0.0129***	-0.0124***	-0.0046+
	[0.0020]	[0.0020]	[0.0023]	[0.0020]	[0.0020]	[0.0023]
Immigrant	-0.0613***	-0.0618***	-0.0658***	-0.0613***	-0.0618***	-0.0658***
	[0.0023]	[0.0023]	[0.0026]	[0.0023]	[0.0023]	[0.0026]
Religious	0.0283***	0.0294***	0.0490***	0.0278***	0.0290***	0.0490***
	[0.0023]	[0.0023]	[0.0028]	[0.0023]	[0.0023]	[0.0028]
% Population Receiving Income Support in District		-0.3139*	-0.2309		-0.3210*	-0.2348
		[0.1328]	[0.1527]		[0.1329]	[0.1528]
Children 0-5		-0.0174***	-0.004		-0.0173***	-0.004
		[0.0027]	[0.0030]		[0.0027]	[0.0030]
Children 6-17		-0.0043*	-0.0075**		-0.0043*	-0.0075**
		[0.0022]	[0.0025]		[0.0022]	[0.0025]
Diploma			0.0035***			0.0035***
			[0.0008]			[0.0008]
Trips			0.0569***			0.0569***
			[0.0024]			[0.0024]
Salary (Working Population)			0.0034***			0.0034***
			[0.0004]			[0.0004]
_cons	1.1797***	1.2030***	1.1313***	1.1803***	1.2040***	1.1310***
	[0.0055]	[0.0093]	[0.0112]	[0.0055]	[0.0093]	[0.0111]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	70715	70715	45969	70715	70715	45969
adj. R^2	0.122	0.123	0.123	0.122	0.123	0.123

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets, Data set: cross-sectional data for the entire population.

By distinguishing between the effect terrorism has on the religious and secular population we were able to see and discover that the coefficient for the main effects of terrorism are of higher statistical significance and larger in magnitude then we previously were able to see in Table 1. When we look at the religious population we can now see that the interaction variable is positive and significant. This may suggest that the religious population has a "correction effect"; the interaction variable's coefficient is positive and often larger in magnitude than the main effects which can indicate perhaps that, surprisingly, as a whole, the level of life satisfaction for the religious population increases in the aftermath of terrorism.

We found the coefficients for the main effect of terrorism to be significant in the opposite direction from the coefficient of the interaction variable between religion and terrorism. Previously, when we viewed the effect terrorism has on the population as a whole we were unable to see that terrorism affects different segments of the population in the opposite direction and we were lead to believe that the magnitude of the effect is relatively small.

In the next section we test our hypothesis on a panel data set model to determine if there is a causal relationship. This is necessary since we were unable to ascertain a causal relationship in the cross-sectional model alone due to the limitations mentioned above.

Longitudinal Panel Data Set: Analysis at the District Level

<u>Methodology</u>

The strategy used in this section is based on a difference-in-difference approach that utilizes the variation of terror fatalities across time and space (monthly data by district) to control for possible time or location specific effects as used by Berrebi & Klor (2008). This model allows us to estimate the causal effect of terrorism by comparing changes in average life satisfaction of localities that suffered terror attacks (treated group) versus changes in average life satisfaction in localities that did not suffer from terror attacks (control group). The key identifying assumption of this approach is that in the absence of terrorism the trend of the average life satisfaction of the treated and control localities would be the same.

We use a panel data set to control for time-invariant differences in life satisfaction as well as area independent variations. This enables us to address the first limitation to the LSA: omitted variables (Fret et al. 2009). Omitted variables can cause correlations due to variables that co-vary with life satisfaction and the public good (bad). Still there may be time variant regional effects that are correlated with happiness and the variable of concern, and therefore we include district fixed effects and yearly indicator variables.

The second limitation to the LSA is spatial resolution. The CBS does not publish the life satisfaction survey results by locality for privacy reasons; hence the lowest available location resolution is at a sub-district level. The issue of spatial resolution is important for the LSA (Frey et al. 2009). It is critical to choose the right spatial units or regions across which change in life satisfaction are identified. Terrorism is often seen as having far

reaching psychological repercussions beyond the immediate victims or targets as mentioned above (Schuster et al., 2001; Silver et al., 2002). Therefore, it's crucial to understand whether the climate of fear is confined geographically or not. However, the average effect for people affected by terrorism is also underestimated if the spatial resolution is too coarse; people not affected by terrorism are wrongly taken into account. Frey et al. (2009) has found that their results for the effect terrorism had on life satisfaction were better when analyzed at a lower spatial resolution of locality. In Israel, continuous terror has been found to create similar distress in proximal and remote communities (Shalev et al. 2006). Taking everything into account, we concluded that analysis at the district level was the best spatial resolution for the purpose of this research.

The third limitation to the life satisfaction approach is compensating variation (Frey et al. 2009). In the context of terrorism, compensating variation takes place when people living in a locality which is exposed to terror should experience a reduction in their life satisfaction. However, instead, in equilibrium, they have compensation in other fields such as job market and salaries. In this case, on the one hand, terrorism reduces life satisfaction, but, on the other hand, receiving a larger income increases life satisfaction. In reality, various restrictions such as transaction costs or inability to move apartments prevent complete arbitrage and hence there is no compensation. In this manner, the residual effect of terrorism is captured in reported life satisfaction when studied across regions. Moreover, the LSA is not limited when taking into account compensation channels, such as salary and other variables usually accounted for in life satisfaction

functions. To control for any compensation occurring in a specific location or at a given time, we include fixed effects for years and districts.

An additional issue we considered is ecological fallacy (Tiebout, 1956; Berrebi & Klor, 2008), which may bias analysis of panel data. We based our analysis on the average life satisfaction for each district; this does not allow us to differentiate between individuals or subgroup of the population and the changes they experience. Let's take, for example, a case in which a terrorist attack takes place in a district where the majority of the population is religious. If we find a decrease in the average life satisfaction the following month for the same district, we may conclude that terrorism negatively affects the life satisfaction of the religious population. This is ecological fallacy, associating an average change with a change in the entire population. In this example, it may be possible that the average decrease we found in life satisfaction is due entirely to the secular population in the district although they are the minority. The factor of the subgroup (religious population) may not have had a connection with the change in the district as a whole.

We dealt with the bias of ecological fallacy by applying two methods. In the first method, we used an interaction variable to isolate the effect on each segment of the population (religious and secular). The data used consists of two observations for each month and district, once with the average life satisfaction for the religious population and once for the secular population. For example, our data includes an observation that represents the average life satisfaction in the district of Jerusalem during January 2002 for the religious population alone and a separate observation for the same month and district with average life satisfaction for the secular population alone. This method compares the two populations. In the second method we created two separate data sets, one for each

population. By doing so in each data set we test the effect terrorism has on the average life satisfaction for the religious population and secular population separately.

Note: we analyze the effect terrorism has on life satisfaction of the population during the month following the attack. This is justified through studies from the field of PTSD that have found the effect terrorism has on the population may last from two til six months following an attack (Schlenger et al., 2002; Galea et al., 2002; Silver et al., 2002).

Given all of the above, using a panel data set is the best way to overcome endogeneity and allows for a causal relationship and thus can enable us to identify the effect terrorism has on life satisfaction[13].

<u>Empirical Results</u>

Table 3 estimates the effect of terrorism on the life satisfaction of the whole population using a panel data set which consists of 1,008 observations that account for 12 month in each of the 12 years across 7 districts[14].

Fixed effect regression model with a logarithmic transformation:

$\ln(\text{Life Satisfaction})_{d,t} = \alpha + \beta(\text{Terror Variable})_{d,t-1} + \gamma X_{d,t} + \delta \text{Year} + \lambda \text{District}_d + \varepsilon_{d,t}$

Where $(\text{Life Satisfaction})_{d,t}$ is the average life satisfaction in district d during month t. α is the intercept. $(\text{Terror Variable})_{d,t-1}$ is one of two terror variables (casualties **within** or originally **from** a district) each used in a separate regression as a proxy for terrorism in district d the previous month ($t\text{-}1$). $X_{d,t}$ is a vector of averages for each of the demographic

---

[13] To see a detailed explanation regarding direction of causality between terrorism and life satisfaction see Frey et al. (2009)

[14] The life satisfaction data from the CBS was collapsed by district and month and was weighted by sample weights provided with the data from the CBS.

and economic control variables as described above for district d during month t. Year is a set of indicator variables for each year in the sample to control for yearly changes that affect life satisfaction. District$_d$ is a set of indicator variables for each district employed to control for district specific characteristics which affect the population's life satisfaction. $\varepsilon_{d,t}$ is the random error in location d during month t.

In Table 3 we see that terrorism has a small negative and significant effect on the life satisfaction of the whole population. Both the number of casualties **within** and **from** a district negatively affect the average life satisfaction of the population (-0.0007 and -0.0011 respectively both significant at the 5% level).

The significance and direction of the effect for the rest of the coefficients are similar to the results found in the cross-sectional analysis apart from children, Salary and Diploma.

Our results in Table 3 show that the effect of children on life satisfaction can change depending on the age of the children. Children under age of 5 have a negative significant effect while children between the ages of 6-17 have a positive significant effect on life satisfaction. The difference in the effect children have on life satisfaction as a function of their age is supported by previous literature (Margolis & Myrskylä, 2011). Salary and education are not significant in this regression.

To properly capture the economic effect we include the percent of the people in each district who have the ability to cover their expenses, in addition to the percent of the population receiving income support. The Percent of the Population Receiving Income Support loses its significance when the variable Able to Cover Expenses is added to the

regression. Able to Cover Expenses is significant and has a positive effect on life

satisfaction.

Table 3: Entire Population								
Dependent Variable: Ln(Life Satisfaction)								
	1	2	3	4	1	2	3	4
Casualties Within District (Last month)	-0.0009*	-0.0009*	-0.0009**	-0.0007*				
	[0.0004]	[0.0004]	[0.0004]	[0.0003]				
Casualties From District (Last month)					-0.0015**	-0.0014**	-0.0015**	-0.0011*
					[0.0005]	[0.0005]	[0.0005]	[0.0005]
Poor Health	-0.0967***	-0.0891***	-0.0868***	-0.0840***	-0.0970***	-0.0893***	-0.0868***	-0.0841***
	[0.0147]	[0.0143]	[0.0148]	[0.0143]	[0.0147]	[0.0143]	[0.0148]	[0.0143]
Married	0.1698***	0.1520***	0.1516***	0.1448***	0.1691***	0.1516***	0.1512***	0.1444***
	[0.0134]	[0.0133]	[0.0134]	[0.0130]	[0.0134]	[0.0133]	[0.0134]	[0.0130]
Female	-0.0139	-0.0146	-0.0121	-0.013	-0.0139	-0.0145	-0.0121	-0.013
	[0.0136]	[0.0132]	[0.0135]	[0.0131]	[0.0136]	[0.0132]	[0.0135]	[0.0131]
Age	-0.0172***	-0.0130***	-0.0141***	-0.0122***	-0.0172***	-0.0130***	-0.0142***	-0.0122***
	[0.0023]	[0.0023]	[0.0024]	[0.0023]	[0.0023]	[0.0023]	[0.0024]	[0.0023]
Child 0-5	-0.0261*	-0.0461***	-0.0464***	-0.0345**	-0.0253*	-0.0453***	-0.0456***	-0.0339**
	[0.0116]	[0.0117]	[0.0118]	[0.0115]	[0.0116]	[0.0117]	[0.0118]	[0.0115]
Child 6-17	0.0316**	0.0249*	0.0234+	0.0281*	0.0309*	0.0243*	0.0227+	0.0275*
	[0.0122]	[0.0119]	[0.0120]	[0.0116]	[0.0122]	[0.0119]	[0.0119]	[0.0116]
Immigrant		-0.0530***	-0.0493***	-0.0423***		-0.0531***	-0.0494***	-0.0424***
		[0.0129]	[0.0132]	[0.0128]		[0.0129]	[0.0132]	[0.0128]
Religious		0.0632***	0.0670***	0.0827***		0.0628***	0.0666***	0.0824***
		[0.0094]	[0.0098]	[0.0097]		[0.0094]	[0.0098]	[0.0097]
% Population Receiving Income Support in District		-0.2630*	-0.2655*	-0.1389		-0.2667*	-0.2710*	-0.1441
		[0.1250]	[0.1268]	[0.1238]		[0.1250]	[0.1269]	[0.1239]
Salary			0.0025	-0.0018			0.0025	-0.0018
			[0.0018]	[0.0018]			[0.0018]	[0.0018]
Diploma			0.0021	-0.0066			0.0024	-0.0064
			[0.0041]	[0.0041]			[0.0041]	[0.0041]
Trips				0.0580***				0.0584***
				[0.0145]				[0.0145]
Able to Cover Expenses				0.0405***				0.0402***
				[0.0064]				[0.0064]
_cons	1.1514***	1.1692***	1.1509***	1.0471***	1.1518***	1.1698***	1.1513***	1.0482***
	[0.0160]	[0.0179]	[0.0209]	[0.0254]	[0.0159]	[0.0179]	[0.0209]	[0.0254]
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	995	995	994	994	995	995	994	994
adj. R^2	0.389	0.431	0.427	0.464	0.39	0.431	0.427	0.464

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Source: Panel data set for the whole population.

Next, using two different methods as mentioned above, we present the results for our hypothesis that terrorism has a different effect on the life satisfaction of the religious and secular segment of the population.

In Table 4 we implemented the first method in which we compare the effect terrorism has on the religious and secular population. The panel data set used for Table 4 contains life satisfaction for the religious and secular population separately, as mentioned above, and consist of 2,016 observations which account for 12 month in each of the 12 years across 7 districts, once for the religious population and once for the secular population.

The model used in Table 4 has an additional interaction variable for terrorism and religion:

$\ln(\text{Life Satisfaction})_{d,r,t} = \alpha + \beta_1(\text{Terror Variable})_{d,t-1} + \beta_2(\text{Religious})_{d,r,t}*(\text{Terror Variable})_{d,t-1} + \gamma(\text{Religious})_{d,r,t} + \delta X_{d,r,t} + \lambda \text{Year} + \rho \text{District}_d + \varepsilon_{d,r,t}$.

Where $(\text{Life Satisfaction})_{d,r,t}$ is the average life satisfaction in district d, for the religious or secular population r ($r = 0,1$), during month t. α is the intercept. $(\text{Terror Variable})_{d,t-1}$ 1 is one of two terror variables used separately as a proxy for terrorism in district d for the previous month $t-1$. $(\text{Religious})_{d,r,t}$ is an indicator variable for the religious population in district d during month t. $X_{d,r,t}$ is a vector for demographic and economic control variables for district d population r during month t. Year is a set of indicator variables for each year in the sample to control for yearly changes that effect life satisfaction. District$_d$ is a set of indicator variables for each district employed to control for district specific characteristics which affect the population's life satisfaction. $\varepsilon_{d,t}$ is the random error in location d during month t for population r.

Table 4: Religious VS Secular Population

Dependent Variable: Ln(Life Satisfaction)

	1	2	3	4	1	2	3	4
Casualties Within District (Last month)	-0.0015*	-0.0017**	-0.0017**	-0.0015**				
	[0.0006]	[0.0006]	[0.0005]	[0.0005]				
Religious* Casualties Within District (Last month)	0.0018*	0.0019*	0.0017*	0.0018*				
	[0.0008]	[0.0008]	[0.0007]	[0.0007]				
Casualties From District (Last month)					-0.0026**	-0.0029**	-0.0029***	-0.0026***
					[0.0009]	[0.0009]	[0.0008]	[0.0008]
Religious* Casualties From District (Last month)					0.0037**	0.0038**	0.0034**	0.0036***
					[0.0012]	[0.0012]	[0.0011]	[0.0011]
Religious	0.0217***	0.0213***	0.0316***	0.0400***	0.0212***	0.0208***	0.0311***	0.0396***
	[0.0032]	[0.0031]	[0.0034]	[0.0037]	[0.0032]	[0.0031]	[0.0034]	[0.0037]
Poor Health	-0.1387***	-0.1360***	-0.1096***	-0.0995***	-0.1388***	-0.1361***	-0.1098***	-0.0997***
	[0.0111]	[0.0111]	[0.0109]	[0.0108]	[0.0111]	[0.0111]	[0.0109]	[0.0108]
Married	0.1156***	0.1144***	0.0906***	0.0938***	0.1160***	0.1147***	0.0909***	0.0942***
	[0.0113]	[0.0113]	[0.0107]	[0.0105]	[0.0113]	[0.0113]	[0.0107]	[0.0105]
Female	-0.0173	-0.0174	-0.0283**	-0.0264**	-0.0165	-0.0167	-0.0277**	-0.0258*
	[0.0106]	[0.0106]	[0.0101]	[0.0100]	[0.0106]	[0.0106]	[0.0101]	[0.0100]
Age	-0.0155***	-0.0134***	-0.0137***	-0.0136***	-0.0156***	-0.0135***	-0.0137***	-0.0136***
	[0.0018]	[0.0019]	[0.0019]	[0.0018]	[0.0018]	[0.0019]	[0.0019]	[0.0018]
Child 0-5	0.0031	0.0011	0.0047	0.0075	0.0025	0.0005	0.0043	0.0071
	[0.0108]	[0.0109]	[0.0102]	[0.0101]	[0.0108]	[0.0109]	[0.0102]	[0.0101]
Child 6-17	0.0329***	0.0305**	0.0133	0.0160+	0.0328***	0.0303**	0.0131	0.0158+
	[0.0097]	[0.0098]	[0.0091]	[0.0090]	[0.0097]	[0.0098]	[0.0091]	[0.0090]
Immigrant		-0.0297**	-0.0451***	-0.0422***		-0.0299**	-0.0454***	-0.0425***
		[0.0112]	[0.0106]	[0.0104]		[0.0112]	[0.0105]	[0.0104]
% Population Receiving Income Support in District		-0.3501*	-0.3775**	-0.2571+		-0.3469*	-0.3765**	-0.2554+
		[0.1566]	[0.1422]	[0.1403]		[0.1565]	[0.1422]	[0.1402]
Salary			0.0047***	0.0024+			0.0046***	0.0023+
			[0.0013]	[0.0014]			[0.0013]	[0.0014]
Diploma			0.003	-0.0012			0.003	-0.0012
			[0.0031]	[0.0031]			[0.0031]	[0.0031]
Trips				0.0242*				0.0251*
				[0.0110]				[0.0110]
Able to Cover Expenses				0.0398***				0.0397***
				[0.0049]				[0.0049]
_cons	1.1802***	1.2108***	1.2018***	1.0940***	1.1795***	1.2099***	1.2017***	1.0938***
	[0.0133]	[0.0176]	[0.0180]	[0.0217]	[0.0133]	[0.0176]	[0.0180]	[0.0217]
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1970	1970	1956	1954	1970	1970	1956	1954
adj. R^2	0.343	0.346	0.372	0.395	0.344	0.348	0.373	0.396

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets, Data set: Panel data for the religious and secular population

From our results in table 4 we can see that terrorism has a significant and negative effect on the life satisfaction for the secular population and a positive significant effect for the religious population. The coefficient for the main effect of the number of casualties **within** a district and **from** a district are -0.0015 (PV<1%) and -0.0026 (PV<0.01%) respectively. These results reveal that when we divide the population by religious beliefs the main effect of terrorism on life satisfaction is significant and almost double in size by comparison to the effect on the total population (Table 3). In this model the coefficients for the interaction between religion and terrorism is positive and significant both for the number of casualties **within** and **from** the district (0.0018 significant at the 5% lever and 0.0036 significant at the 0.1% level respectively).

The effect of terrorism on the life satisfaction of the religious population is calculated by adding the coefficients for the main and interaction effects. This is equal to 0.0003 (-0.0015 + 0.0018) and 0.001 (-0.0026 + 0.0036) for the number of casualties **within** and **from** a district respectively. Not only does the religious population not experience a reduction in average life satisfaction, but with every additional death the previous month their life satisfaction increases by 0.03% on a four point scale for the number of casualties **within** a district and by 0.1% for the number of casualties **from** a district.

Terrorism usually happens in clusters. One terrorist attack increases the chances for a subsequent attack in the same locality (Berrebi & Lakdawalla, 2007). Therefore, in order to put the effect of terrorism on life satisfaction into perspective, we look at the average number of casualties in a district during a month with terrorism. In a month in which

there was terrorism there were, on average, 10[15] casualties in a district. Therefore, in times of terror, the effect of terrorism on life satisfaction is 0.015 (-0.0015*10) which is a 1.5% decrease in life satisfaction on a 4 point scale. The magnitude of this effect is approximately 0.02[16] which is the size of the average variance in the average life satisfaction in a district over a whole decade (2002-2013).

Alternatively, we try and put the effect of terrorism on life satisfaction into perspective in comparison to the effect of salary on life satisfaction (Frey et al. 2009). We find that the effect of one standard deviation in salary on life satisfaction is only roughly 4.5 times as large as the effect of one standard deviation in Casualties **Within** District [17]. Therefore the effect of terrorism is 20% as large as the effect of salary on life satisfaction and thus, terrorism affects life satisfaction in a sizable way.

By comparing the results in Tables 3 & 4, we can see that the remaining coefficients are similar, irrespective of the population segmentation, aside from Salary and Child 0-5. Salary is positive and significant, while the presence of children between the ages of 0-5 is not significant. Perhaps, the difference in the results can be explained in that salary and having children are two aspects that differ between the religious and secular populations.

In Table 5 & Table 6, we present the second method where we test our hypothesis on separate data sets for each population. In this model we do not compare the effect of terrorism on the life satisfaction of the two populations, rather we view the effect terrorism has on the life satisfaction of each population on its own.

---

[15] We defined a month as a month with terrorism if there were more than 3 casualties in a district that month. A month with at least one casualty in a district will have on average 7 casualty that month.
[16] See Life satisfaction variance within districts calculation in Appendix 2.
[17] 0.0024*0.0014/0.0015*0.0005= 4.667

A panel data set was built separately for each population and consists of data on life satisfaction and other control variable only for the relevant population. The structures of these data sets are similar to the one used in Table 3 and each contain 1,008 observations.

For each population the model used was a fixed effect regression model with a logarithmic transformation:

$$\ln(\text{Life Satisfaction})_{d,t} = \alpha + \beta(\text{Terror Variable})_{d,t\text{-}1} + \gamma X_{d,t} + \delta \text{Year} + \lambda \text{District}_d + \varepsilon_{d,t}$$

Where (Life Satisfaction)$_{d,t}$ is the average life satisfaction in district d during month t. α is the intercept. (Terror Variable) $_{d,t\text{-}1}$ is one of two terror variables used separately as a proxy for terrorism in district d during the previous month $t\text{-}1$. $X_{d,t}$ is a vector of demographic and economic control variables for district d during month t. Year is a set of indicator variables for each year in the sample to control for yearly changes that effect life satisfaction. District$_d$ is a set of indicator variables for each district employed to control for district specific characteristics which affect the population's life satisfaction. $\varepsilon_{d,t}$ is the random error in district d during month t.

This model does not include a variable for religion since each data set is already defined by religion.

Table 5 estimates the effect terrorism has on the life satisfaction of the religious population alone. We found the effect of terrorism on life satisfaction for the religious population to be no different than zero. But, when we look at the results estimated for the secular population in Table 6 we find that terrorism has a negative and significant effect on the life satisfaction of the secular population (-0.011 PV<5% for Casualties Within and -0.002 PV<1% for Casualties From).

The remaining coefficients in the estimated regressions (Table 5 & Table 6) are slightly different from each other and from the results in our estimation for both populations together (Table 4). Gender and being an immigrant do not have a significant effect on the life satisfaction of the religious population but has a negative and significant effect on the life satisfaction of the secular population. Salary does not have an effect on the life satisfaction of the religious population but significantly and positively affects the life satisfaction of the secular population. Having children between the ages of 6-17 positively affects the life satisfaction of the religious population and does not significantly affect the life satisfaction of the secular population. Education has a negative effect on the life satisfaction of the secular population and does not affect the religious population. Taking trips has a positive significant effect on the life satisfaction of the religious population but not on the life satisfaction of the secular population.

Table 5: Religious Population

Dependent Variable: Ln(Life Satisfaction)

	1	2	3	4	1	2	3	4
Casualties Within District (Last month)	0.0001	-0.0002	-0.0003	-0.0001				
	[0.0007]	[0.0007]	[0.0006]	[0.0006]				
Casualties From District (Last month)					0.0009	0.0005	0.0001	0.0004
					[0.0010]	[0.0010]	[0.0009]	[0.0009]
Poor Health	-0.1647***	-0.1687***	-0.1140***	-0.1022***	-0.1649***	-0.1687***	-0.1141***	-0.1023***
	[0.0176]	[0.0176]	[0.0160]	[0.0161]	[0.0176]	[0.0176]	[0.0160]	[0.0161]
Married	0.1292***	0.1345***	0.0901***	0.0959***	0.1297***	0.1349***	0.0904***	0.0964***
	[0.0175]	[0.0175]	[0.0158]	[0.0157]	[0.0175]	[0.0175]	[0.0159]	[0.0158]
Female	0.0213	0.0247	-0.0159	-0.0158	0.0218	0.0252	-0.0157	-0.0155
	[0.0157]	[0.0156]	[0.0146]	[0.0144]	[0.0157]	[0.0157]	[0.0146]	[0.0144]
Age	-0.0138***	-0.0177***	-0.0165***	-0.0167***	-0.0138***	-0.0177***	-0.0164***	-0.0166***
	[0.0028]	[0.0031]	[0.0028]	[0.0028]	[0.0028]	[0.0031]	[0.0028]	[0.0028]
Child 0-5	-0.0006	0.0062	0.0151	0.0192	-0.0017	0.005	0.0143	0.0183
	[0.0153]	[0.0153]	[0.0137]	[0.0136]	[0.0153]	[0.0153]	[0.0137]	[0.0136]
Child 6-17	0.0337*	0.0368*	0.0233+	0.0274*	0.0335*	0.0365*	0.0230+	0.0272*
	[0.0146]	[0.0145]	[0.0130]	[0.0129]	[0.0146]	[0.0145]	[0.0130]	[0.0129]
Immigrant		0.0540**	0	-0.0016		0.0539**	-0.0001	-0.0017
		[0.0184]	[0.0171]	[0.0169]		[0.0184]	[0.0171]	[0.0169]
% Population Receiving Income Support in District		-0.7164**	-0.7397***	-0.6470**		-0.6931**	-0.7223***	-0.6282**
		[0.2450]	[0.2155]	[0.2146]		[0.2451]	[0.2157]	[0.2148]
Salary			0.0014	0.0001			0.0013	0
			[0.0018]	[0.0018]			[0.0018]	[0.0018]
Diploma			0.0047	0.0025			0.0046	0.0023
			[0.0045]	[0.0044]			[0.0045]	[0.0044]
Trips				0.0319+				0.0325+
				[0.0176]				[0.0176]
Able to Cover Expenses				0.0271***				0.0273***
				[0.0069]				[0.0069]
_cons	1.1708***	1.2138***	1.2557***	1.1798***	1.1685***	1.2098***	1.2533***	1.1768***
	[0.0211]	[0.0274]	[0.0259]	[0.0314]	[0.0210]	[0.0274]	[0.0259]	[0.0314]
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	990	990	982	982	990	990	982	982
adj. R^2	0.253	0.264	0.259	0.275	0.254	0.265	0.259	0.275

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets. Data set: Panel data for religious population only.

Dependent Variable: Ln(Life Satisfaction)								
	1	2	3	4	1	2	3	4
Casualties Within District (Last month)	-0.0013*	-0.0013*	-0.0013**	-0.0011*				
	[0.0005]	[0.0005]	[0.0005]	[0.0005]				
Casualties From District (Last month)					-0.0022**	-0.0023**	-0.0023**	-0.0020**
					[0.0008]	[0.0008]	[0.0008]	[0.0007]
Poor Health	-0.1133***	-0.1059***	-0.1011***	-0.0998***	-0.1136***	-0.1062***	-0.1014***	-0.1001***
	[0.0138]	[0.0135]	[0.0146]	[0.0142]	[0.0138]	[0.0135]	[0.0145]	[0.0142]
Married	0.0813***	0.0877***	0.0794***	0.0785***	0.0816***	0.0880***	0.0798***	0.0787***
	[0.0146]	[0.0142]	[0.0148]	[0.0145]	[0.0146]	[0.0142]	[0.0148]	[0.0145]
Female	-0.0598***	-0.0484***	-0.0270$^+$	-0.0268$^+$	-0.0593***	-0.0479***	-0.0264$^+$	-0.0263$^+$
	[0.0141]	[0.0138]	[0.0140]	[0.0139]	[0.0141]	[0.0138]	[0.0140]	[0.0139]
Age	-0.0139***	-0.0084***	-0.0093***	-0.0083**	-0.0140***	-0.0085***	-0.0094***	-0.0084**
	[0.0023]	[0.0023]	[0.0027]	[0.0026]	[0.0023]	[0.0023]	[0.0027]	[0.0026]
Child 0-5	0.0340$^+$	-0.0022	-0.016	-0.0063	0.0340$^+$	-0.0023	-0.0161	-0.0061
	[0.0174]	[0.0176]	[0.0183]	[0.0182]	[0.0174]	[0.0176]	[0.0183]	[0.0181]
Child 6-17	0.0333*	0.0166	0.0051	0.0048	0.0325*	0.0158	0.0043	0.004
	[0.0132]	[0.0130]	[0.0129]	[0.0127]	[0.0131]	[0.0130]	[0.0129]	[0.0126]
Immigrant		-0.1023***	-0.0810***	-0.0758***		-0.1024***	-0.0814***	-0.0761***
		[0.0136]	[0.0136]	[0.0132]		[0.0136]	[0.0136]	[0.0132]
% Population Receiving Income Support in District		0.0276	0.0518	0.1708		0.0159	0.0389	0.1579
		[0.1855]	[0.1808]	[0.1758]		[0.1853]	[0.1807]	[0.1758]
Salary			0.0122***	0.0075***			0.0121***	0.0073**
			[0.0022]	[0.0022]			[0.0022]	[0.0022]
Diploma			-0.0038	-0.0096*			-0.0035	-0.0093$^+$
			[0.0048]	[0.0048]			[0.0048]	[0.0048]
Trips				0.0152				0.0161
				[0.0142]				[0.0142]
Able to Cover Expenses				0.0559***				0.0557***
				[0.0072]				[0.0072]
_cons	1.2030***	1.2185***	1.1457***	1.0190***	1.2037***	1.2202***	1.1472***	1.0210***
	[0.0174]	[0.0220]	[0.0246]	[0.0290]	[0.0174]	[0.0219]	[0.0245]	[0.0289]
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	980	980	974	972	980	980	974	972
adj. R^2	0.255	0.295	0.287	0.331	0.257	0.297	0.289	0.333

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Panel data for the secular population alone.

It seems that there are some factors that have a consistent effect on life satisfaction, such as poor health, marital status and age, while other factors such as children, salary and education have a varying effect on life satisfaction depending on the population. Studies have shown that the effect of variables on life satisfaction can be cultural dependent (Oishi, Diener, Lucas & Suh, 1999) and, therefore, it is not surprising that we found differences amongst the religious and secular populations, which vary in their beliefs and values.

To summarize, our results support our hypothesis and imply that terrorism affects life satisfaction as a function of religion. Therefore, it is important to divide the population by religious beliefs to better analyze the effect terrorism has on life satisfaction. By doing so, we were able to differentiate between the significant and negative effect terrorism has on the life satisfaction of the non-religious secular population and we were able to see that terrorism does not negatively affect the life satisfaction of the religious population. Furthermore, we found that in the aftermath of terrorism, the life satisfaction of the religious population may increase.

Robustness Tests

In this section we present several robustness tests. The majority of the tests were conducted on the panel data set for both the religious and secular populations together (Table 4). Our robustness tests show that the effect terrorism has on life satisfaction was robust to variation in the terror and life satisfaction variables as well as to alternative models. Falsification tests show that terrorism in the following month does not affect life satisfaction in the present month. In addition, there is no reverse effect of life satisfaction on terrorism.

In the previous section we primarily employed a logarithmic model to test our hypothesis. In the current section we will demonstrate the robustness of our results with additional models.

We begin by testing the sensitivity of our results with a linear model. Next, by transforming the life satisfaction and terrorism variables, we perform additional robustness tests with Logit and Logarithmic models.

Linear Model

The results for the estimation of the linear fixed effects model can be seen in Table 7. The results show that terrorism has a negative significant (PV<1%) effect on the life satisfaction of the secular population and a positive significant (PV<1%) effect on the life satisfaction of the religious population for both terror variables.

Table 7: Linear Model

Dependent Variable: Life Satisfaction						
	2	3	4	2	3	4
Casualties Within District (last month)	-0.0050**	-0.0050**	-0.0044**			
	[0.0018]	[0.0017]	[0.0017]			
Religious* Casualties Within District (last month)	0.0056*	0.0050*	0.0053*			
	[0.0024]	[0.0023]	[0.0023]			
Casualties From District (last month)				-0.0087**	-0.0086***	-0.0079**
				[0.0027]	[0.0026]	[0.0025]
Religious* Casualties From District (last month)				0.0114**	0.0103**	0.0108**
				[0.0036]	[0.0035]	[0.0034]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	1970	1956	1954	1970	1956	1954
adj. R^2	0.372	0.379	0.401	0.373	0.38	0.402

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.

Fixed Effect regression model: $(Life Satisfaction)_{d,r,t} = \alpha + \beta1(Terror Variable)_{d,t-1} + \beta2(Religious)_{d,r,t}*(Terror Variable)_{d,t-1} + \gamma(Religious)_{d,r,t} + \delta X_{d,r,t} + \lambda Year + \rho District_d + \varepsilon_{d,r,t}$

Additional baseline regression control variables included as used in Table 4. Specification can be compared by column number.

<u>Variation in life satisfaction variable</u>

We tested for variation in the life satisfaction variable using two models, the cross-section model and the panel data set model. As described above, life satisfaction is measured on a 4 point scale. Since our higher level objective is to measure whether the population or an individual is satisfied or not, we decided to test the durability of our results when life satisfaction is a dichotomous variable. In addition, we chose to include the cross-sectional model in this robustness test for the variation in life satisfaction variable since the combination of the two enables us to estimate a Logit model. The reason we cannot test the Logit model with the panel data set is because we use the average life satisfaction for a district and, therefore, life satisfaction is not a dichotomous variable even after the transformation.

In the cross-section model we estimate a Logit regression as follows:

The variable Satisfaction 2-2 was constructed by combining the two lower levels of life satisfaction (1 and 2) that were categorized together as '0' (not satisfied) and the two higher levels (3 and 4) were categorized as '1' (satisfied).

Our results are summarized in Table 8 and show a significant (PV<5%) negative effect for the religious population and a significant (PV<5%) positive effect for the secular population for both terror variables.

Table 8: Robustness for Life Satisfaction Variable - Cross-sectional data						
Dependent Variable: Satisfaction 2-2						
	1	2	3	1	2	3
Casualties Within District (last month)	-0.0076[+]	-0.0077[+]	-0.0116[*]			
	[0.0042]	[0.0042]	[0.0053]			
Religious* Casualties Within District (last month)	0.0178[*]	0.0178[*]	0.0347[*]			
	[0.0086]	[0.0086]	[0.0144]			
Casualties From District (last month)				-0.0143[*]	-0.0145[*]	-0.0170[*]
				[0.0065]	[0.0065]	[0.0082]
Religious* Casualties From District (last month)				0.0344[*]	0.0343[*]	0.0510[*]
				[0.0137]	[0.0137]	[0.0221]
_cons	2.3034[***]	2.3564[***]	1.3721[***]	2.3041[***]	2.3578[***]	1.3647[***]
	[0.0658]	[0.1094]	[0.1521]	[0.0653]	[0.1092]	[0.1516]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	70715	70715	45969	70715	70715	45969
Pseudo R^2	0.0988	0.0988	0.1101	0.0988	0.0988	0.1101

[+] $p < 0.1$, [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$. Standard errors in brackets. Data set: cross-sectional data for the entire population.
Regression model: ln(Life Satisfaction 2-2)i = α + $\beta 1$(Terror Variable Previous Month)d + $\beta 2$(Terror Variable Previous Month)*(Religious)i + γ(Religious)i + δXi + λYear + ρDistrict + εi
Additional baseline regression control variables included as used in Table 2. Specification can be compared by column number.

Next we tested the transformation of the life satisfaction variable for the panel data set with the logarithmic model[18]. This way we can test to see how measuring life satisfaction

---

[18] Linear model in Appendix 3

using the average of a dichotomous variable can affect our results. We went back to the original data set and redefined the life satisfaction variable as we did above for the cross-sectional model, then we re-calculated the average life satisfaction per district. After this transformation, the Life Satisfaction 2-2 variable in the panel data set by month and district can range from 0 to 1 and represents the average life satisfaction for a given time in a specific district. No other changes were made in the data. Our results are summarized in Table 9.

From table 9 we can see that the coefficients for the number of casualties **within** a district are -0.0022 (PV<5%) and 0.0041 (PV<1%) while for the number of casualties **from** a district they are -0.0042 (PV<1%) and 0.0074 (PV<0.1%) for the religious and secular populations respectively. The magnitude and significance of the results are stronger then the results estimated in Table 4 when life satisfaction is measured on a scale from 1 to 4.

Table 9: Robustness for Life Satisfaction Variable - Panel data

	Dependent variable: Life satisfaction 2-2			
	2	3	4	2	3	4
Casualties Within District (last month)	-0.0024*	-0.0024**	-0.0022*			
	[0.0009]	[0.0009]	[0.0009]			
Religious* Casualties Within District (last month)	0.0042**	0.0039**	0.0041**			
	[0.0013]	[0.0013]	[0.0012]			
Killed From District (last month)				-0.0044**	-0.0045**	-0.0042**
				[0.0014]	[0.0014]	[0.0014]
Religious*Killed From District (last month)				0.0076***	0.0071***	0.0074***
				[0.0019]	[0.0019]	[0.0019]
_cons	-0.0660*	-0.1154***	-0.2768***	-0.0653*	-0.1141***	-0.2749***
	[0.0275]	[0.0308]	[0.0374]	[0.0275]	[0.0308]	[0.0373]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	1967	1955	1953	1967	1955	1953
adj. R^2	0.191	0.208	0.233	0.194	0.21	0.235

$^{+} p < 0.1$, $^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.
Fixed Effect regression model: ln(Life Satisfaction 2-2) d,r,t $= \alpha + \beta1$(Terror Variable)d,t-1 $+ \beta2$(Religious)d,r,t *(Terror Variable)d,t-1 $+\gamma$(Religiousd),r,t $+ \delta$X d,r,t $+\lambda$Year $+\rho$Districtd $+\varepsilon$ d,r,t
Additional baseline regression control variables included as used in Table 4. Specification can be compared by column number.

These tests show us that our results are robust to changes in the type of model (Linear, Logit and Logarithmic) as well as to changes in the dependent variables. Our results seem to indicate that when we measure life satisfaction quantitatively, as well as qualitatively, our hypothesis is further strengthened. More so, the majority of the coefficients for the terror variable when life satisfaction is measured on a 2 point scale were larger in magnitude in comparison to the coefficients when life satisfaction was measured on a 4 point scale.

<u>Variation in terror variable</u>

Throughout our analysis we approximate terrorism with the two variables that represent the number of casualties (**from** and **within** a district). Next we use the number of terror attacks within a district as an alternative approximation for terrorism. The number of terror attacks within a district measures incidence of terror but does not account for the extent of the outcome of terrorism- nor its severity- which can have a significant influence on terrorism and its effect on society. Our results are summarized in Table 10.

Looking at the results in Table 10, we can see that, when we measured terrorism by the number of attacks instead of the number of casualties (within or from a district), the coefficients are significant at the 10% level, and we still found a negative effect for the secular population and a positive effect for the religious population.

Table 10: Variation in Terror Variable

Dependent Variable: Ln(Life Satisfaction)				
	1	2	3	4
Attacks Within District (last month)	-0.0037	-0.0045[+]	-0.0045[*]	-0.0038[+]
	[0.0024]	[0.0024]	[0.0022]	[0.0021]
Religious*Attacks Within District (Last month)	0.0060[+]	0.0061[+]	0.0058[+]	0.0058[*]
	[0.0033]	[0.0033]	[0.0029]	[0.0029]
Year	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes
N	1970	1970	1956	1954
adj. R^2	0.342	0.345	0.371	0.394

[+] $p < 0.1$, [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.

Fixed Effect regression model: ln(Life Satisfaction) d,r,t $= \alpha + \beta 1$(Terror Variable)d,t-1 $+ \beta 2$(Religious) d,r,t*(Terror Variable)d,t-1 $+\gamma$(Religious)d,r,t $+ \delta$X d,r,t $+\lambda$Year $+\rho$Districtd $+\varepsilon$ d,r,t

Additional baseline regression control variables included as used in Table 4. Specification can be compared by column number.

This may indicate that the impact of terrorism on life satisfaction for religious and secular populations is robust to alternative approximations of terrorism, although, when we take the severity of the attack into account, our results are further strengthened.

Future terror effect on life satisfaction today

Our analysis is based on the logical assumption that the life satisfaction of a population is affected by terrorism in the previous month. In Table 11 we present results for the falsification assumption that future terrorism may affect life satisfaction today.

From the results shown in Table 11 we can see that future terrorism does not significantly affect life satisfaction which further strengthens our results.

Table 11: Effect of Future Terror on Life Satisfaction

Dependent Variable: Ln(Life Satisfaction)

	2	3	4	2	3	4
Casualties Within District (Next month)	-0.0003	-0.0002	-0.0001			
	[0.0006]	[0.0005]	[0.0005]			
Religious* Casualties Within District (Next month)	0.0005	0.0003	0.0003			
	[0.0008]	[0.0007]	[0.0007]			
Casualties From District (Next month)				-0.0009	-0.0008	-0.0007
				[0.0009]	[0.0008]	[0.0008]
Religious* Casualties From District (Next month)				0.001	0.0007	0.0007
				[0.0012]	[0.0011]	[0.0011]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	1970	1957	1955	1970	1957	1955
adj. R2	0.341	0.368	0.392	0.342	0.368	0.392

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.
Fixed Effect regression model: ln(Life Satisfaction)d,r,t $= \alpha + \beta1$(Terror Variable)d,t+1 $+$ $\beta2$(Religious)d,r,t*(Terror Variable)d,t+1 $+\gamma$(Religious)d,r,t $+ \delta X$ d,r,t $+\lambda$Year $+ \rho$Districtd $+ \varepsilon$ d,r,t
Additional baseline regression control variables included as used in Table 4. Specification can be compared by column number.

Reverse causality

Next we tested the reverse hypothesis: life satisfaction affects terrorism. Our results are summarized in Table 12. We can see from our results that our analysis does not suffer from reverse causality; life satisfaction does not affect terrorism.

Table 12: Reverse Causality

	Casualties Within District (Next month)	Casualties From District (Next month)
Ln(Life Satisfaction)	0.5457	0.1562
	[2.3737]	[1.5990]
_cons	4.0191	2.606
	[2.7205]	[1.8326]
Year	Yes	Yes
District	Yes	Yes
N	1002	1002
adj. R^2	0.144	0.12

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets. Data set: Panel data for entire population.
Fixed Effect regression model: (Terror Variable)d,t+1 $= \alpha + \beta1$Ln(life Satisfaction)d,t $+ \lambda$Year $+\rho$Districtd $+\varepsilon$ d,t
No other control variables were added to the regression.

Excluding 2002:

During the year 2002, Israel experienced an unusually large amount of terrorism. During 2002 alone there were a total of 395 casualties **within** a district compared to an average total of 48 in the following years (see Figure 3). For this reason, we test the durability of our results when we exclude observations from year 2002.

Our results are presented in Table 13 and show that, although we excluded year 2002 from our analysis, our results withstand and even produce larger coefficients.

Table 13: Excluding Year 2002						
Dependent Variable Ln(Life Satisfaction)						
	2	3	4	2	3	4
Casualties Within District (last month)	-0.0022**	-0.0022**	-0.0020**			
	[0.0009]	[0.0008]	[0.0008]			
Religious* Casualties Within District (last month)	0.0032**	0.0028**	0.0029**			
	[0.0012]	[0.0011]	[0.0010]			
Casualties From District (last month)				-0.0034**	-0.0034**	-0.0031**
				[0.0012]	[0.0011]	[0.0010]
Religious* Casualties From District (last month)				0.0052**	0.0046**	0.0048***
				[0.0017]	[0.0015]	[0.0014]
_cons	1.2076***	1.2009***	1.0904***	1.2077***	1.2013***	1.0907***
	[0.0205]	[0.0206]	[0.0239]	[0.0204]	[0.0206]	[0.0239]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	1817	1803	1801	1817	1803	1801
adj. R^2	0.345	0.37	0.396	0.346	0.371	0.397

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.
Regression model: ln(Life Satisfaction)d,r,t $= \alpha + \beta1$(Terror Variable)d,t-1 $+ \beta2$(Religious)d,r,t *(Terror Variable)d,t-1 $+\gamma$(Religious)d,r,t $+ \delta$Xd,r,t $+ \lambda$Year $+ \rho$Districtd $+ \varepsilon$ d,r,t
Additional baseline regression control variables included as used in Table 4. Specification can be compared by column number.

Part II: Life Satisfaction Survey during "Lone Wolf" Terror Wave

In the first section, we employed the CBS life satisfaction survey to test the effect of terrorism on life satisfaction in Israel. In this section, we employ data on life satisfaction gathered through a survey we designed and conducted to test our hypothesis.

Not only was the survey designed specifically for the purpose of this paper, the data we collected on terrorism is also unique. The terror wave sampled is unique in the sense that the terror attacks were perpetrated by unaffiliated "lone wolf"[19] terrorists. To the best of our knowledge, previous studies have not focused on the effect of individually conducted terror attacks on life satisfaction of the population.

Some say that the "lone wolf" terror wave started on September 13th 2015 when Alexander Levlovich was killed as a result of his vehicle being struck by rocks. Others claim the wave started on October 1st 2015 when Rabbi Eitam Henkin, 31, and his wife Na'ama, 30, of Neria, parents of four young children, were killed in a drive-by shooting attack.

Data

Life Satisfaction Data

A short survey regarding life satisfaction, fear and attitude toward the current terror wave was sent out on October 16th 2015, approximately two weeks into the terror wave. The survey was sent out as a google form through the web (Facebook, email, WhatsApp)

---

[19] A lone wolf or lone-wolf terrorist is someone who prepares and commits violent acts alone, outside of any command structure and without material assistance from any group. However, he or she may be influenced or motivated by the ideology and beliefs of an external group, and may act in support of such a group.

requesting participation from Jews over 18 for a thesis project regarding the current security situation in Israel. The first section consisted of general background questions similar to those asked by the CBS; the second section asked questions regarding life satisfaction and fear in general; the third section asked questions regarding life satisfaction and fear in light of the recent terror wave; the fourth section queried about terrorism in general; and the fifth and final section asked about the sense of security and government policy[20]. After removing from the data respondents who were not Jewish or over 18, our data sample consists of 471 respondents distributed between the 16th of October and the 23rd of November, a little over 5 weeks. The responses are not evenly distributed over the period time (Figure 8 & 9).

In our survey, we asked the respondents to define themselves as religious or not, in addition to describing their level of religiousness. Two hundred and thirty seven self-defined as religious (50.4%) while two hundred and fourteen (45.6%) self-defined as not religious. In our analysis we use the respondent's self-definition of religiosity. We can see from Figure 10 that the religious population is on average more satisfied with life than the secular population.

---

[20] See "Lone Wolf" life satisfaction survey questionnaire in Appendix 4.

Figure 8: Life satisfaction over time
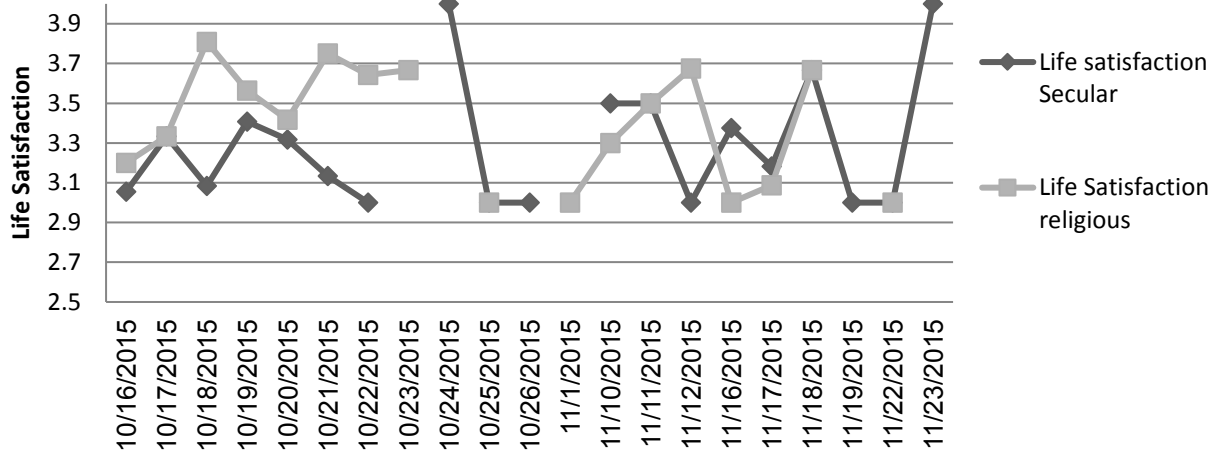
Figure 9: Sample distribution
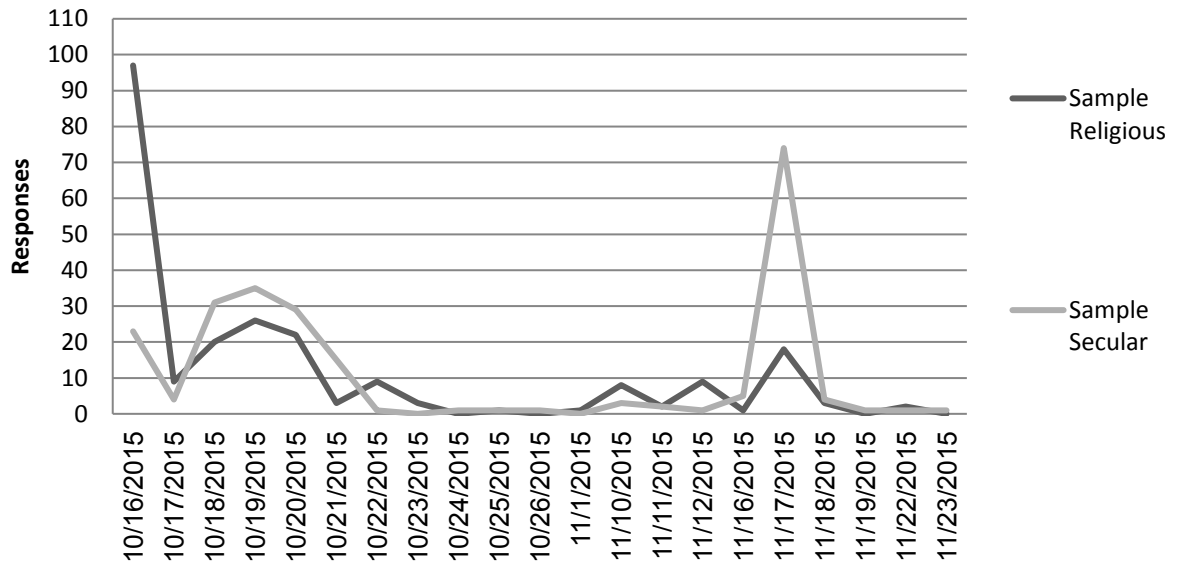
Figure 10: Life satisfaction by religion - "Lone wolf" terrorism

Religious	Average Life Satisfaction
Secular	3.214592275
Religious	3.365546218
Grand Total	3.290870488

Data on Terrorism

The data on terrorism was collected from a website called "The Jewish Voice" (Hakol Hyehudi), a site which collected detailed information on terror attacks during the "lone wolf" terror wave[21]. This enabled us to collect accurate detailed information on all kind of attacks: attacks without casualties, attacks with non-fatal injuries as well as attacks with fatal injuries[22]. In addition, we collected information on attempted and failed attacks and on arrests of terrorist with weapons. For each incident we have information regarding the location of the attack (municipality) and the origin of the casualties. Figure 11 presents daily data on the number of casualties with a distinction between non-fatal injuries and deaths. We can see there are casualties in the majority of the days during this time period.

---

[21] http://hakolhayehudi.co.il/news-section/%D7%91%D7%98%D7%97%D7%95%D7%9F-1

[22] In this section casualties refer to non-fatal injuries as well as fatal injuries.

Figure 11: Terror Attacks
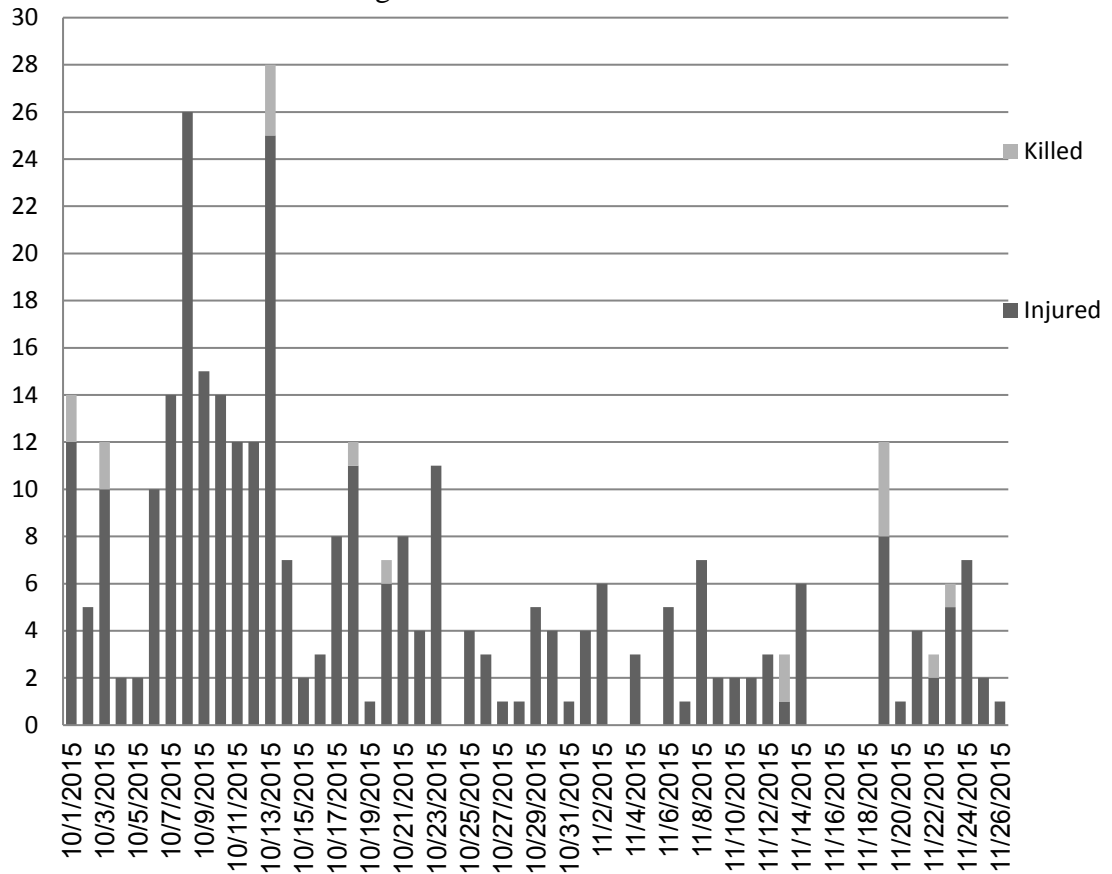
Descriptive Statistics

We divide the terrorism data into two time periods. We do this as our sample spans over a short period of time, and we do not have available life satisfaction survey data for every day in the sample. We divided the sample from the 26th of September till the 27th of October and from the 28th of October till the 26th of November. This allows us to group the results by the two major waves of responses to the life satisfaction.

Figure 12: Two time periods - Terror and life satisfaction
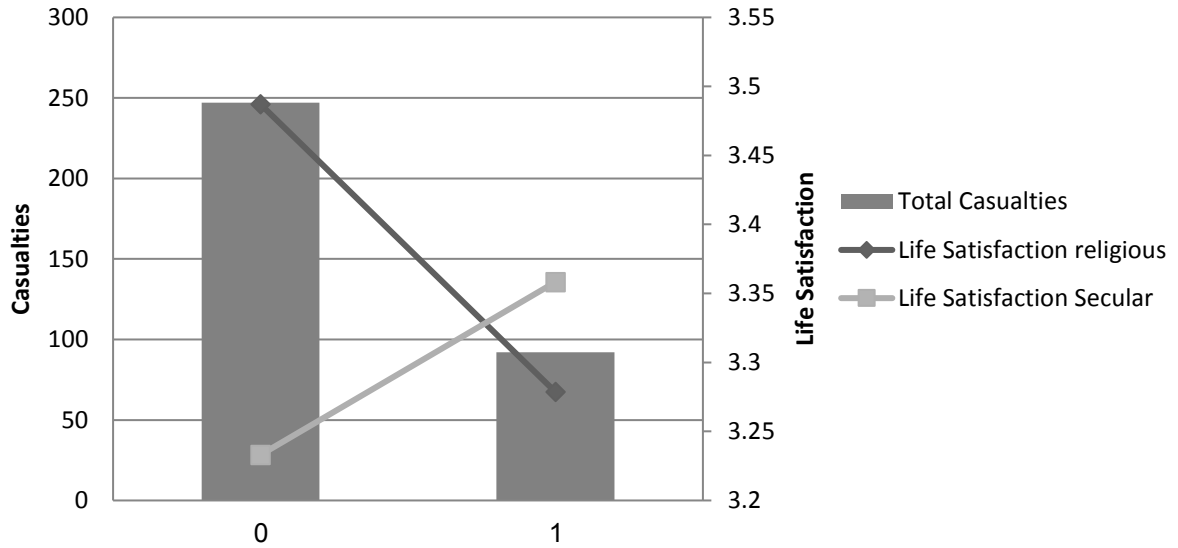
From our results in Figure 12 we can see that in time period '0' there were more casualties than in the following time period '1'. During time period '0', when terrorism was relatively high, the average life satisfaction for the religious population was higher than the average life satisfaction for the secular population. In the subsequent time period '1', which has less terrorism, there is a decrease in the average life satisfaction for the religious population and an increase in the average life satisfaction for the secular population relative to time period '0'. This can indicate that terrorism negatively affects the life satisfaction of the secular population and positively affects the life satisfaction of the religious population.

Our analysis is based on unconditional means, and we are aware that there may be other factors which influence the effect terrorism has on the life satisfaction that we do not account for. However, at first glance, we can see that when terrorism decreases, the life satisfaction of the secular population increases and the life satisfaction of the religious

population decreases. When terrorism was high, the life satisfaction for the secular population was at a low, and for the religious population it was at a high.

Empirical Strategies and Results

To further test our data, we created a daily database in which each observation includes the average life satisfaction for the total population, religious population and secular population sampled that day. We correlate these life satisfaction variables with daily casualties as can be seen in Figure 13.

Figure 13: Correlation of terrorism and average life satisfaction by religion

Casualties

Life Satisfaction	0.1107
Life Satisfaction Religious	0.4277
Life Satisfaction Secular	-0.367

We can see from the results of the correlations that the average life satisfaction for the religious population is positively correlated with the number of casualties, while, for the secular population, the number of casualties is negatively correlated with the average life satisfaction.

Regression Analysis:

For the regression analysis we use a cross-sectional database at the individual level. Each observation consists of information regarding a sampled individual combined with daily information on terrorism.

Figure 14: Summary statistics "lone wolf" cross-sectional data

Variable	N	Mean	SD	Min	Max
Life Satisfaction	471	3.29087	0.647665	1	4
Religious	471	0.505308	0.500503	0	1
Same Day Casualties	489	3.846626	3.802905	0	12
Previous Day Casualties	489	3.799591	4.075205	0	12
Previous Two Day Casualties	489	8.887526	6.079193	0	20

Our data consist of 471 observations which include information on individual life satisfaction between the 16th of October and the 23rd of November 2015. In addition, our data consist of information on the number of casualties during that time period[23]. We can see that the average life satisfaction for the sampled population is 3.29 and 50% of the population is religious.

We correlate the number of casualties with the life satisfaction of the secular and religious individuals separately as can be seen in Figure 15. We can see from the correlational results in Table 13 that the life satisfaction for the secular and religious individuals is negatively and positively correlated with the number of casualties respectively.

---

[23] We do not have life satisfaction data for every day throughout that time period.

Figure 15: correlation results for cross-sectional data

	Casualties	Life Satisfaction Secular
Casualties	1	
Life Satisfaction Secular	-0.033	1

	Casualties	Life Satisfaction Religious
Casualties	1	
Life Satisfaction Religious	0.1211	1

Next we estimated three OLS linear regression model as follows:

1. $(\text{Life Satisfaction})_i = \alpha + \beta(\text{Religious})_i + \gamma(\text{Same Day Casualties}) + \delta(\text{Same Day Casualties})*(\text{Religious})_i + \varepsilon_i$

2. $(\text{Life Satisfaction})_i = \alpha + \beta(\text{Religious})_i + \gamma(\text{Previous Day Casualties}) + \delta(\text{Previous Day Casualties})*(\text{Religious})_i + \varepsilon_i$

3. $(\text{Life Satisfaction})_i = \alpha + \beta(\text{Religious})_i + \gamma(\text{Previous Two Day Casualties}) + \delta(\text{Previous Two Day Casualties})*(\text{Religious})_i + \varepsilon_i$

Where $(\text{Life Satisfaction})_i$ is life satisfaction of individual i. $(\text{Religious})_i$ is an indicator variable for religion regarding individual i (1 for the religious population). (Same Day Casualties) is the total number of casualties the same day individual i was sampled. (Previous Day Casualties) is the total number of casualties the day prior to the day individual i was sampled. (Previous Two Day Casualties) is the total number of casualties

in the two days prior the day individual i was sampled. ε_i is the random error for individual i.

We chose to test the effect of terrorism on life satisfaction using three separate equations that vary according to the time period in which we measure terrorism. We do so since we do not know how long lasting the effect of "lone wolf" terrorism is on life satisfaction. Note, we do not know if individual i was sampled before or after a terror attack which may have occurred on that same day, therefore the first regression model may be biased. In the second and third regression model we do not include terrorism on the day the individual was sampled to avoid this bias.

Table 14: Individual life satisfaction and terrorism

Dependent Variable: Life Satisfaction			
	1	2	3
Religious	0.0488	0.0508	-0.0643
	[0.1072]	[0.1053]	[0.1436]
Religious* Casualties	0.0256+		
	[0.0154]		
Casualties	-0.0024		
	[0.0097]		
Religious* Casualties the previous day		0.0290*	
		[0.0146]	
Casualties previous day		-0.0009	
		[0.0096]	
Religious* Casualties the previous two days (total)			0.0193+
			[0.0108]
Casualties the previous two days (total)			0.0026
			[0.0061]
_cons	3.2136***	3.2103***	3.1928***
	[0.0638]	[0.0648]	[0.0723]
N	471	471	471
adj. R^2	0.005	0.009	0.009

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in brackets.
Regression includes sample weights. Data set: Cross-sectional data for "lone wolf" terrorism.

From our results in Table 14 we can see that terrorism positively and significantly affects the life satisfaction of religious individuals and does not significantly affect the life satisfaction of secular individuals. Our results show that the number of casualties the previous day has the strongest and most significant effect on the religious population. The coefficient for casualties the previous day with an interaction with religion is 0.029 PV<5% while for same day casualties and casualties the previous two days PV<10% and the coefficients are 0.0256 and 0.0193 respectively.

However, our results are limited by our use of cross-sectional data. As mentioned above, in a cross-sectional model, we do not have the ability to prove a causal effect and we are limited to correlational results. Nevertheless, our results indicate that "lone wolf" terrorism affect the life satisfaction of religious individuals in a positive and significant way. We were unable to show that "lone wolf" terrorism affects the secular population through our regression analysis. However, when we correlated the average life satisfaction of the religious population and secular population separately with the number of casualties, we found a negative relationship for the secular population and a positive relationship for the religious population. The direction of this relationship was similar when we correlated individual level life satisfaction. Furthermore, when we divided the data in to two time periods we found an indication that terrorism negatively affects the life satisfaction of the secular population and positively affects the life satisfaction of the religious population.

Fear, Terrorism, Religiosity and Government

In this section, we present the responses to the questionnaires on fear and terrorism. We describe the relative distribution of the answers amongst the religious and secular populations.

Interestingly, differences in responses were found in three key areas: the perception of security provided by government policy, the perception of security provided by security forces, and the behavioral change with respect to news update frequency (see Figure 16). The two populations did not exhibit significant differences with regard to the majority of the questions that portray personal fear. Most relevant, when asked if the current attacks affect your life satisfaction, 66% of the secular population answered in the affirmative in contrast to only 50% of the religious population.

Questions Related To Government:

In general: Do you think the security forces succeed in providing a sense of safety?

Religious:

No
~~43%~~

Yes
87%

Secular:

No
25%

Yes
75%
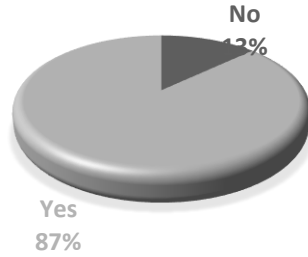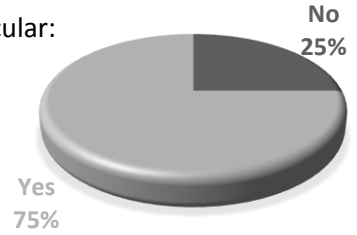
In general: Do you think government policy is successful in providing a sense of safety?

Religious:

No
45%

Yes
55%

Secular:

Yes
25%

No
75%
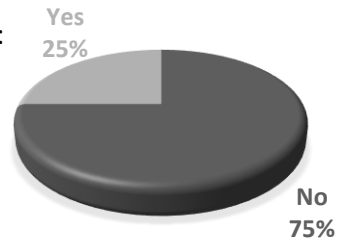
During the current terror wave: Do you think the security forces succeed in providing

 a sense of safety?

Religious:

No
33%

Yes
67%

Secular:

No
~~44%~~

Yes
56%

During the current terror wave: Do you think government policy is successful in providing

 a sense of safety?

Religious:

Yes
31%

No
69%

Secular:

Yes
14%

No
86%
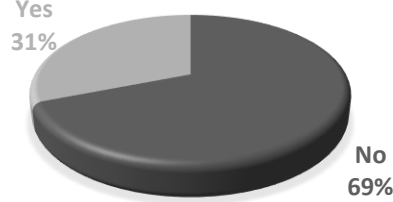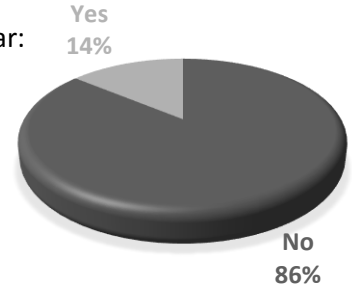
Questions Related To The Individual:

In general: Are you afraid of terrorism?

Religious:

Rarely
41%

No
49%

Yes
10%

Secular:

No
48%

Rarely
44%

Yes
8%
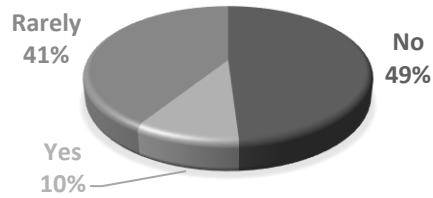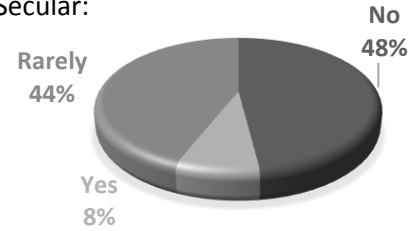
In light of recent terror attacks: What do you think is the chance of you being a victim of terror?

Religious:

High
6%

None
3%

Moderate
34%

Small
57%

Secular:

High
3%

None
3%

Moderate
35%

Small
59%
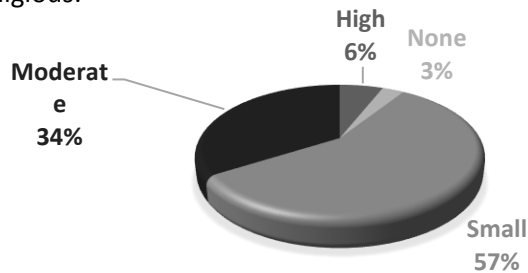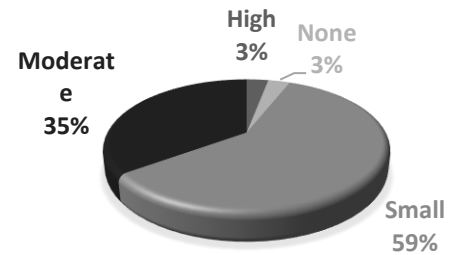
In light of recent terror attacks: Do you feel additional stress?

Religious:

- A lot 4%
- Not At All 8%
- Yes 48%
- No 40%

Secular:

- A lot 4%
- Not At All 6%
- Yes 48%
- No 42%
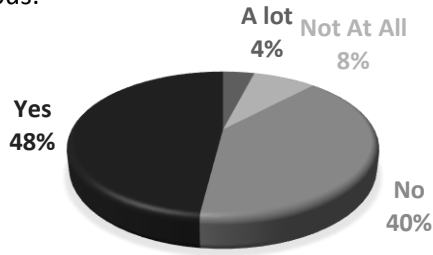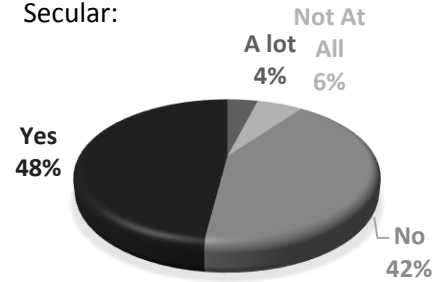
In light of recent terror attacks: Do you avoid eating out at restaurants?

Religious:

- Yes 16%
- No 84%

Secular:

- Yes 19%
- No 81%
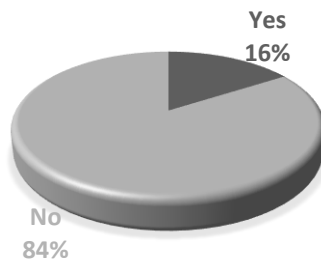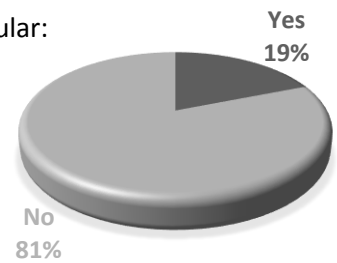
In light of recent terror attacks: Do you avoid taking public transportation?

Religious:

- Yes 34%
- No 66%

Secular:

- Yes 5%
- No 65%
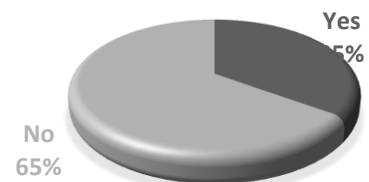
In light of recent terror attacks: Do you avoid visiting public locations?

Religious:

- No 39%
- Yes 61%

Secular:

- No 33%
- Yes 67%
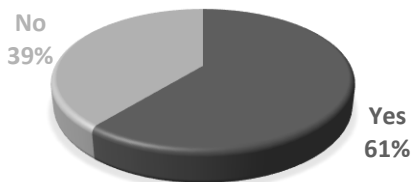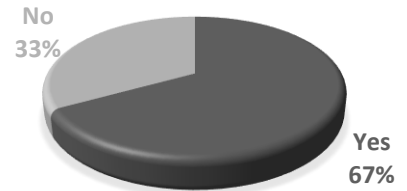
In light of recent terror attacks: Do you feel afraid?

Religious:

Rarely
35%

Yes
48%

No
17%

Secular:

Rarely
43%

Yes
44%

No
13%
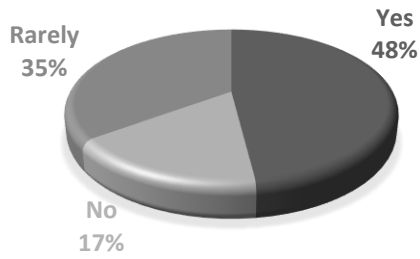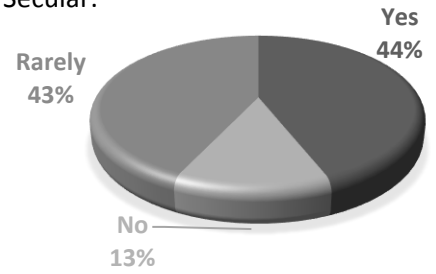
Would you define yourself generally as a fearful person?
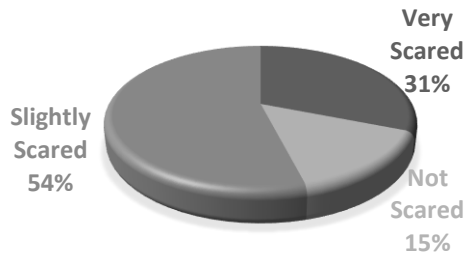
Religious:

Yes
25%

No
75%

Secular:

Yes
22%

No
78%
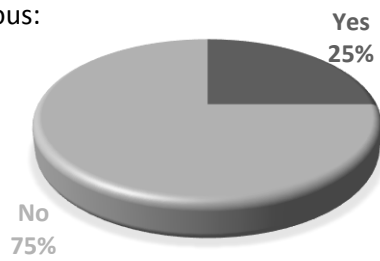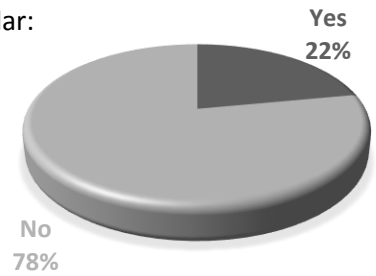
During the Second Intifada (2002-2004): You remember feeling:

Religious:

Very
Scared
31%

Slightly
Scared
54%

Not
Scared
15%
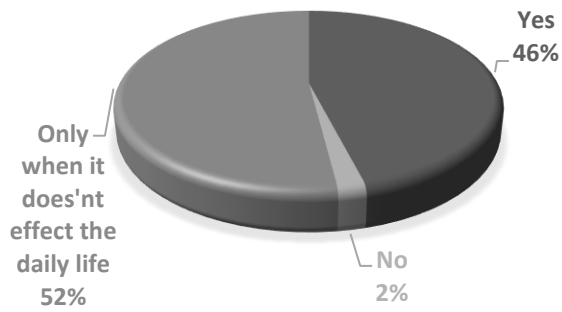
Secular:

Very
Scared
25%

Slightly
Scared
60%

Not
Scared
15%
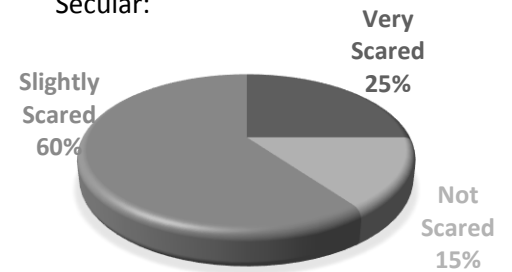
In your opinion, has the Jewish Israeli population adapted to terrorism in Israel?

Religious:

Secular:

Yes
46%

No
2%

Only when it does'nt effect the daily life
52%

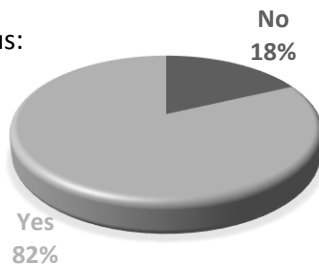Only when it does'nt effect the daily life
54%

Yes
42%

No
4%
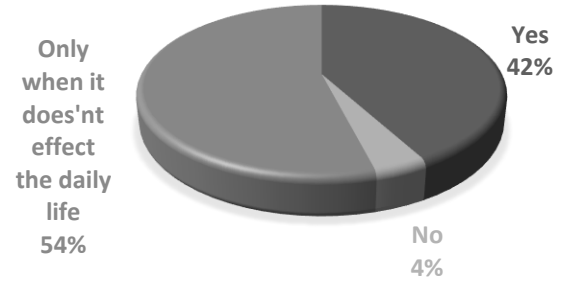
In light of the recent terror: Do you check the news more often?

Religious:

Secular:

No
18%

Yes
82%

No
32%

Yes
68%
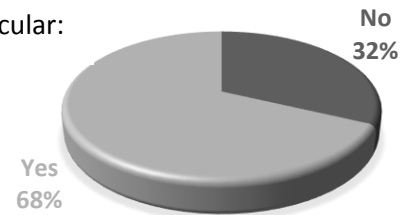
Do you feel that the security situation affects your general life satisfaction?

Religious:

Secular:

No
50%

Yes
50%

34%

Yes
66%
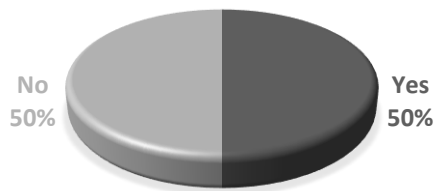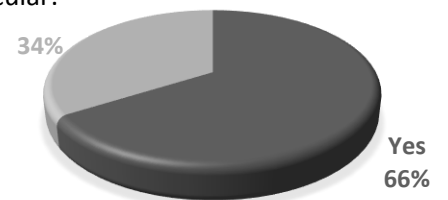
To better understand the differences recorded in the responses of the religious and secular population, we now present studies regarding religion, government and fear. We have found that religion and government provide three main resources for dealing with terrorism: safety, control and meaning. The state may enable citizens to take responsibility for their own safety and take a part in protecting themselves. In addition, the state and religion may provide a sense of control. Finally, religion and social institutions may provide a mechanism to discover meaning in one's life.

The first resource in which the state plays an important role in dealing with the fear of terrorism is safety based. The state plays an important role helping citizens cope with the fear of terrorism. The state can employ certain strategies to allow the citizens to feel a sense of responsibility and avoid victimization. By doing so, the state can minimize the citizen's fears, and invite the individual to be involved in terrorism risk management as a logical step in maintaining security (Mythen & Walklate, 2006).

The religious population in comparison to the secular population may express more support in the government and its security forces. Hence, it is possible that this support in the government enabled the religious population to be involved in the terrorism risk management. By doing so, the religious population may not experience the negative effect terrorism has on life satisfaction, unlike the secular population that suffered a loss in life satisfaction due to terrorism.

The second resource we found dealt with the sense of control. When personal control is threatened, people strengthen external systems of control, such as God and government (Kay, Gaucher, Napier, Callan & Laurin, 2008). Resilience in the face of terrorism may

be found by looking at how God and government are both capable of helping people cope with threats to their perception of order in the world and loss of personal control.

While we found that religious individuals correlated their belief in God with trust in government, Kay, Laurin, Blatz, Chua, Galinsky (2010) found a tradeoff between religion and government. They test the hypothesis that these external systems themselves may be substitutable for one another, and events that undermine the perceived dependability of the government will strengthen belief in a controlling God and vice versa. They conclude that God and government can be flexibly substituted to serve needs for order and structure; hence they are in a hydraulic relationship. However, Kay et al. (2010) explain that because both variables may have many determinants other than one another, which dictate their absolute levels. Both variables may be very high or very low at once for a variety of reasons, hence, it is not necessary that wherever the absolute level of one is high, the absolute level of the other is low. Therefore, our results that found God and government to be positively correlated with one another, do not contradict with their proposed hydraulic relationship.

The third resource we found concerned the search for meaning in life. Trauma can destabilize an individual and can lead to a search for meaning (Frankel, 1985). Hobfoll et al. (2007) found that posttraumatic growth was indirectly related to greater authoritarianism for Jews. For the religious population it is possible that terrorism leads to additional trust in government which provides meaning. Hence, the search for additional meaning by the religious population increases its life satisfaction. In contrast, it is possible that the secular population does not search for additional meaning in light of trauma and, therefore, trauma does not result in additional support in the government.

Thus, in the absence of posttraumatic growth, terrorism reduces the life satisfaction of the secular population.

In our sample we found that the religious population has more trust in the government and its security forces and in their ability to protect them, possibly supporting the theories proposed above. In Figure 17 we take a look at the distribution of votes in our sample for the religious and secular population. This enables us to view the support of our sampled population in the government as a function of religion.

We can see that the majority of the religious population voted for the coalition while the majority of the secular population voted for the opposition. This distinction can also explain why the religious population in general shows more support in the government. Interestingly this support seems to be unaffected by terrorism.

Figure 17: Votes for coalition
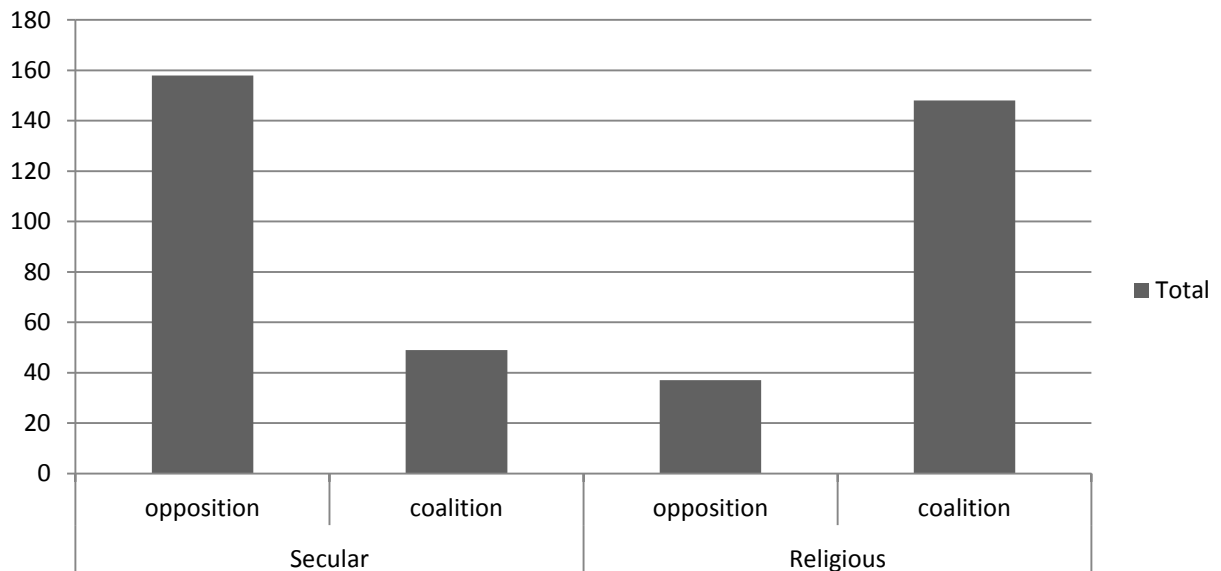
Conclusion

This study empirically identifies a previously unnoticed relationship between terrorism and life satisfaction for the (Jewish) Israeli population.

Our findings confirm our hypothesis and show that terrorism has a different effect on the life satisfaction of the religious and secular population[24]. Our results show that while terrorism negatively affects the life satisfaction of the secular population, the life satisfaction of the religious population increases in the aftermath of terrorism. We demonstrate and show that the effect of terrorism on the life satisfaction of the population as a whole is very small when not analyzed as a function of religion. And therefore, it is important to divide the population by religious beliefs to correctly capture the relationship between terrorism and life satisfaction in Israel.

Our results were statistically significant and of sizable magnitude. We were able to show, first, a correlational followed by a causal relationship between terrorism and life satisfaction as a function of religion based on cross-sectional and panel data respectively. We demonstrate the relationship across a robust set of model types and specifications.

For the panel data, we used two methods to isolate the effect terrorism has on the religious and secular populations. In the first method, where we compare the effect of terrorism on the religious population to the effect of terrorism on the secular population, we find terrorism to negatively and significantly affect the life satisfaction of the secular population and positively and significantly affect the life satisfaction of the religious population. In the second method, when we look at the effect on each population

---

[24] Our analysis is based on a much more extensive period of time compared to the previous study done by Zussman et al. (2012) regarding the Israeli population.

separately we find terrorism to negatively and significantly affect the life satisfaction of the secular population, but the effect is no different from zero for the religious population.

Even so, there are still limitations and areas for further research. Future research may test our hypothesis on the Israeli population using individual level data over time (to track individuals over time). Future research may also extend the analysis to include other religions and other cultures, as well, beyond the Jewish Israeli population that was the focus of our study.

In addition, our study is the first study (as far as we know) to test the effect of "lone wolf" terrorism on life satisfaction. By extending our analysis to include terrorism of a different nature, we are able to contribute to the literature on the topic. We found that the positive and significant relationship between terrorism and the life satisfaction of the religious population withstands for "lone wolf", individually conducted attacks, as well as for organized terrorism. In addition, we found that when individuals were asked directly whether terrorism affects their general life satisfaction, the majority of the secular population responded in the affirmative in contrast to the religious population where the opposite was observed. We suggest that future studies should examine this effect based on a more extensive data base which may lead to significant results for the secular population as well.

Furthermore, we observed an association between religion, government and resilience. Future research may find it interesting to further study the relationship between the three in regard to terrorism.

Our results have implications for governments and public policy. For example, when policy makers attempt to deal with PTSD and other consequences caused by terrorism, our results can be beneficial and help better allocate resources amongst the population.

References

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *The American Economic Review*, *93*(1), 113-132.

Abadie, A., & Gardeazabal, J. (2008). Terrorism and the world economy.*European Economic Review*, *52*(1), 1-27.

Baker, L. A., Cahalin, L. P., Gerst, K., & Burr, J. A. (2005). Productive activities and subjective well-being among older adults: The influence of number of activities and time commitment. *Social Indicators Research*,*73*(3), 431-458.

Becker, G. S., & Rubinstein, Y. (2004). Fear and the response to terrorism: an economic analysis. *University of Chicago mimeo*.

Berman, E. (2000). Sect, subsidy and sacrifice: an economist's view of ultra-orthodox Jews. *Quarterly Journal of Economics, 115*(3), 905–953.

Berrebi, C., & Klor, E. F. (2006). On terrorism and electoral outcomes theory and evidence from the Israeli-Palestinian conflict. *Journal of conflict resolution*, *50*(6), 899-925.

Berrebi, C., & Klor, E. F. (2008). Are voters sensitive to terrorism? Direct evidence from the Israeli electorate. *American Political Science Review*,*102*(03), 279-301.

Berrebi, C., & Klor, E. F. (2010). The impact of terrorism on the defence industry. *Economica*, *77*(307), 518-543.

Berrebi, C., & Lakdawalla, D. (2007). How does terrorism risk vary across space and time? An analysis based on the Israeli experience. *Defence and Peace Economics*, *18*(2), 113-131.

Berrebi, C., & Ostwald, J. (2014). Terrorism and the Labor Force Evidence of an Effect on Female Labor Force Participation and the Labor Gender Gap.*Journal of Conflict Resolution*, 0022002714535251.

Berrebi, C., & Ostwald, J. (2015). Terrorism and fertility: evidence for a causal influence of terrorism on fertility. *Oxford Economic Papers*, *67*(1), 63-82.

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle?. *Social science & medicine*, *66*(8), 1733-1749.

Blanchflower, D. G., & Oswald, A. J. (2011). International happiness: A new view on the measure of performance. *The Academy of Management Perspectives*, *25*(1), 6-22.

Bleich, A., Gelkopf, M., & Solomon, Z. (2003). Exposure to terrorism, stress-related mental health symptoms, and coping behaviors among a nationally representative sample in Israel. *Jama*, *290*(5), 612-620.

Bleich, A., Gelkopf, M., Melamed, Y., & Solomon, Z. (2006). Mental health and resiliency following 44 months of terrorism: a survey of an Israeli national representative sample. *BMC medicine*, *4*(1), 1.

Blomberg, S. B., & Hess, G. D. (2006). How much does violence tax trade?.*The Review of Economics and Statistics*, *88*(4), 599-612.

Blomberg, S. B., Hess, G. D., & Orphanides, A. (2004). The macroeconomic

     consequences of terrorism. *Journal of monetary economics*, *51*(5), 1007-1032.

Boscarino, J. A., Figley, C. R., & Adams, R. E. (2003). Fear of terrorism in New York

     after the September 11 terrorist attacks: implications for emergency mental health

     and preparedness. *International journal of emergency mental health*, *5*(4), 199.

Chamberlain, K.,& Zika, S. (1988). Religiosity, Life Meaning and Wellbeing: Some

     Relationships in a Sample of Women. *Journal for the Scientific Study of Religion,*

     27(3), 411-420.

Chen, A. H., & Siems, T. F. (2004). The effects of terrorism on global capital

     markets. *European journal of political economy*, *20*(2), 349-366.

Chen, Y. Y., & Koenig, H. G. (2006). Traumatic stress and religion: Is there a

     relationship? A review of empirical findings. *Journal of Religion and*

     Health,*45*(3), 371-381.

Cohen, A. B. (2002). The importance of spirituality in well-being for Jews and

     Christians. *Journal of happiness studies*, *3*(3), 287-310.

Cohen-Zada, D., & Sander, W. (2011). Religious Participation versus Shopping: What

     Makes People Happier? *Journal of Law and Economics*, *54*(4), 889-908

Collier, P. (1999). On the economic consequences of civil war. *Oxford economic*

     papers, *51*(1), 168-183.

Diener, E., & Suh, E.M., & Lucas, R.E., & Smith, H.L. (1999). Subjective Well-Being:

     Three Decades of Progress. *Psychological Bulletin*, *125*(2), 276-302.

Diener, E.D, & Clifton, D. (2002). Life Satisfaction and Religiosity in broad probability Samples. *Psychological Inquiry*, *13*(3), *Religion and psychology*, 206-209

Eckstein, Z., & Tsiddon, D. (2004). Macroeconomic consequences of terror: theory and the case of Israel. *Journal of Monetary Economics*, *51*(5), 971-1002.

Eldor, R., & Melnick, R. (2004). Financial markets and terrorism. *European Journal of Political Economy*, *20*(2), 367-386.

Ellison, C. G. (1991). Religious involvement and subjective well-being.*Journal of health and social behavior*, 80-99.

Elran, M. (2006). Israel's national resilience: The influence of the second intifada on Israel society. *Tel Aviv, Israel: Jaffee Center for Strategic Studies, Tel Aviv University*.

Enders, W., & Sandler, T. (1991). Causality between transnational terrorism and tourism: The case of Spain. *Studies in Conflict & Terrorism*, *14*(1), 49-58.

Fielding, D. (2003a). Counting the cost of the Intifada: consumption, saving and political instability in Israel. *Public Choice*, *116*(3-4), 297-312.

Fielding, D. (2003b). Modelling political instability and economic performance: Israeli investment during the intifada. *Economica*, *70*(277), 159-186.

Fischer, P., Greitemeyer, T., Kastenmüller, A., Jonas, E., & Frey, D. (2006). Coping with terrorism: The impact of increased salience of terrorism on mood and self-efficacy of intrinsically religious and nonreligious people. Personality and Social Psychology Bulletin, 32(3), 365-377

Fleischer, A., & Buccola, S. (2002). War, terror, and the tourism market in Israel. *Applied Economics*, *34*(11), 1335-1343.

Frankl, V. E. (1985). *Man's search for meaning*. Simon and Schuster.

Frey, B. S., Luechinger, S., & Stutzer, A. (2007). Calculating tragedy: Assessing the costs of terrorism. *Journal of Economic Surveys*, *21*(1), 1-24.

Frey, B. S., Luechinger, S., & Stutzer, A. (2009). The life satisfaction approach to valuing public goods: The case of terrorism. *Public Choice*, *138*(3-4), 317-345.

Friedland, N., Amit, K., Arian, A., Fleischer, N., & Kirschenbaum, A. (2005).*The concept of social resilience*.

Fry, P.S. (2000). Religious involvement, spirituality and personal meaning for life: Existential predictors of psychological wellbeing in community-residing and institutional care elders. *Aging & Mental Health*, *4*(4), 375-387.

Galea, S., Ahern, J., Resnick, H., Kilpatrick, D., Bucuvalas, M., Gold, J., & Vlahov, D. (2002). Psychological sequelae of the September 11 terrorist attacks in New York City. *New England Journal of Medicine*, *346*(13), 982-987.

Gerber, M. M., Boals, A., & Schuettler, D. (2011). The unique contributions of positive and negative religious coping to posttraumatic growth and PTSD.*Psychology of Religion and Spirituality*, *3*(4), 298.

Gilbert, D., & Abdullah, J. (2004). Holidaytaking and the sense of well-being.*Annals of Tourism Research*, *31*(1), 103-121.

Goldbeck, L., Schmitz, T. G., Besier, T., Herschbach, P., & Henrich, G. (2007). Life satisfaction decreases during adolescence. *Quality of Life Research*, *16*(6), 969-979.

Graham, J. R., & Shier, M. L. (2010). Social work practitioners and subjective well-being: Personal factors that contribute to high levels of subjective well-being. *International Social Work*.

Helliwell, J. F., Layard, R., & Sachs, J. (2013). World happiness report [2012].

Helliwell, J., Layard, R., & Sachs, J. (2016). *World Happiness Report 2016, Update (Vol. I).* New York: Sustainable Development Solutions Network.

Hobfoll, S. E., Hall, B. J., Canetti-Nisim, D., Galea, S., Johnson, R. J., & Palmieri, P. A. (2007). Refining our understanding of traumatic growth in the face of terrorism: Moving from meaning cognitions to doing what is meaningful. *Applied Psychology*, *56*(3), 345-366.

Inglehart, R., & Norris, P. (2004). Sacred and secular. *Religion and politics worldwide*, *1*.

Ito, H., & Lee, D. (2005). Assessing the impact of the September 11 terrorist attacks on US airline demand. *Journal of Economics and Business*, *57*(1), 75-95.

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the national academy of sciences*, *107*(38), 16489-16493.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the econometric society*, 263-291.

Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the government: testing a compensatory control mechanism for the support of external systems. *Journal of personality and social psychology*,*95*(1), 18.

Kay, A. C., Laurin, S., Blatz, C. W., Chua, S. N., & Galinsky, A. D. (2010). For God (or) country: the hydraulic relation between government instability and belief in religious sources of control. *Journal of personality and social psychology*, *99*(5), 725.

Krueger, A. B. (2008). *What makes a terrorist: Economics and the roots of terrorism*. Princeton University Press.

Layard, R., Mayraz, G., & Nickell, S. J. (2009). Does relative income matter? Are the critics right?. *Are the critics right*.

Lim, C., & Putnam, R.D. (2010). Religion, Social Networks, and Life Satisfaction. *American Sociological Review*, *75*(6), 914-933.

Margolis, R., & Myrskylä, M. (2011). A global perspective on happiness and fertility. *Population and Development Review*, *37*(1), 29-56.

Mroczek, D. K., & Spiro III, A. (2005). Change in life satisfaction during adulthood: findings from the veterans affairs normative aging study. *Journal of personality and social psychology*, *88*(1), 189.

Mythen, G., & Walklate, S. (2006). Communicating the terrorist risk: Harnessing a culture of fear?. *Crime, Media, Culture*, *2*(2), 123-142.

Nitsch, V., & Schumacher, D. (2004). Terrorism and international trade: an empirical investigation. *European Journal of Political Economy*, *20*(2), 423-433.

Ochs, J. (2011). *Security and suspicion: An ethnography of everyday life in Israel*. University of Pennsylvania Press.

Oishi, S., Diener, E. F., Lucas, R. E., & Suh, E. M. (1999). Cross-cultural variations in predictors of life satisfaction: Perspectives from needs and values. *Personality and social psychology bulletin*, *25*(8), 980-990.

Pargament, K.I. (2002). The Bitter and the Sweet: A Evaluation of the Cost and Benefits of religiousness. *Psychological inquiry: An International Journal for the Advancement of Psychological Theory*, *13*(3), 168-181.

Romanov, D., Zussman, A., & Zussman, N. (2012). Does terrorism demoralize? Evidence from Israel. *Economica*, *79*(313), 183-198.

Sacks, J. (2012). *The great partnership: Science, religion, and the search for meaning*. Schocken.

Safi, M. (2010). Immigrants' life satisfaction in Europe: Between assimilation and discrimination. *European Sociological Review*, *26*(2), 159-176.

Schlenger, W. E., Caddell, J. M., Ebert, L., Jordan, B. K., Rourke, K. M., Wilson, D., & Kulka, R. A. (2002). Psychological reactions to terrorist attacks: findings from the National Study of Americans' Reactions to September 11. *Jama*, *288*(5), 581-588

Schuster, M. A., Stein, B. D., Jaycox, L. H., Collins, R. L., Marshall, G. N., Elliott, M. N., & Berry, S. H. (2001). A national survey of stress reactions after the

September 11, 2001, terrorist attacks. *New England Journal of Medicine*, *345*(20), 1507-1512.

Senik, C. (2004). When information dominates comparison: Learning from Russian subjective panel data. *Journal of Public Economics*, *88*(9), 2099-2123.

Senik, C. (2014). The French unhappiness puzzle: The cultural dimension of happiness. *Journal of Economic Behavior & Organization*, *106*, 379-401.

Shalev, A. Y., Tuval, R., Sarah Frenkiel-Fishman, M. A., Hadar, H., & Eth, S. (2006). Psychological responses to continuous terror: A study of two communities in Israel. *American Journal of Psychiatry*.

Shalev, A. Y., Tuval-Mashiach, R., & Hadar, H. (2004). Posttraumatic stress disorder as a result of mass trauma. *The Journal of clinical psychiatry*,*65*(suppl 1), 4-10

Shields, M. A., & Price, S. W. (2005). Exploring the economic and social determinants of psychological well-being and perceived social support in England. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *168*(3), 513-537.

Silver, R. C., Holman, E. A., McIntosh, D. N., Poulin, M., & Gil-Rivas, V. (2002). Nationwide longitudinal study of psychological responses to September 11. *Jama*, *288*(10), 1235-1244

Sloboda, B. W. (2003). Assessing the effects of terrorism on tourism by use of time series methods. *Tourism Economics*, *9*(2), 179-190.

Somer, E., Ruvio, A., Soref, E., & Sever, I. (2005). Terrorism, distress and coping: High versus low impact regions and direct versus indirect civilian exposure. *Anxiety, Stress, and Coping*, *18*(3), 165-182

Stiglitz, J., Sen, A. K., & Fitoussi, J. P. (2009). The measurement of economic performance and social progress revisited: reflections and overview.

Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married?. *The Journal of Socio-Economics*, *35*(2), 326-347.

Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Sage Publications.

Tedeschi, R. G., & Calhoun, L. G. (2004). " Posttraumatic growth: Conceptual foundations and empirical evidence". *Psychological inquiry*, *15*(1), 1-18.

Tiebout, C. M. (1956). A pure theory of local expenditures. *The journal of political economy*, 416-424.

Veenhoven, R. (2004). The greatest happiness principle. Happiness as an aim in public policy. *Positive psychology in practice (John Wiley and Sons Inc., Hoboken, NJ, USA)*.

Weinberg, L., Pedahzur, A., & Canetti-Nisim, D. (2003). The social and religious characteristics of suicide bombers and their victims. *Terrorism and Political Violence*, *15*(3), 139-153.

Appendix

1. <u>Table of life satisfaction data variables:</u>

Variable	Description	Code	Properties	Comments
Life Satisfaction	Generally satisfied with life	4	Very Satisfied	Order has been reversed. Calculated using satisf1.
		3	Satisfied	
		2	Not So Satisfied	
		1	Not Satisfied	
Age	Age Group	1	20-14	
		2	25-29	
		3	30-34	
		4	34-49	
		5	40-44	
		6	45-59	
		7	50-54	
		8	44-59	
		9	60-64	
		10	45-74	
		11	75+	
Poor Health	A physical or health problem that exist 6 months or more	1	Yes	Coding was changed from nominal to dichotomous. Calculated using health1.
		0	No	
Married	Indicates if individual is married	1	Yes	Calculated based on nominal variable marital.
		0	No	
Female	Indicates if individual is a female	1	Yes	Calculated based on nominal variable sex.
		0	No	
Immigrant	Indicates if individual is an immigrant	1	Yes	Calculated based on immigry variable, which is a nominal variable that represents year of immigration.
		0	No	
Religious	Defined as religious	1	Yes	Includes ultra-orthodox, orthodox and traditional-religious Jews
		0	No	Includes traditional-not religious and not religious Jews. Calculated based on selfdefj that is a nominal variable.
Children 0-5	Children between the ages 0-5	1	Yes	Calculated from nominal variable chil05.
		0	No	
Children 6-17	Children between the ages 6-17?	1	Yes	Calculated from nominal variable chil617.
		0	No	

Diploma	Highest degree or certificate received	0	None	Corrected for year differences
		1	A certificate of completion of secondary school	
		2	A high school diploma	
		3	Certificate of completion of post-secondary school that is not an academic certificate	
		4	Bachelors Degree BA or equivalent degree including academic certificate	
		5	MA academic degree or equivalent degree (including MD)	
		6	Third academic degree, Ph.D., or equivalent degree	
Trips	Trip or vacation outside of Israel in the past 12 months	1	Yes	Based on trips2 which is a nominal variable.
		0	No	
Year			2002-2013	
District		1	Jerusalem	
		2	North	
		3	Haifa	
		4	Center	
		5	Tel Aviv	
		6	South	
		7	Judea & Samaria	
Ability to cover expenses	Are you able to cover all your household expenses?	1	We don't manage at all	Order has been reversed. Calculated using abilcovr.
		2	We don't really manage	
		3	We manage	
		4	Yes, without a problem	

			2008-2013	2004-2007	2002-2003	
Salary	Gross income last month (before deductions) from all places of work	1	NIS 2,000 or less	NIS 2,000 or less	NIS 1,500 or less	Not corrected for year differences. The change in value takes natural salary growth over the years in to account.
		2	NIS 2,001-3,000	NIS 2,001-3,000	NIS 1,501-2,500	
		3	NIS 3,001-4,000	NIS 3,001-3,500	NIS 2,501-3,000	
		4	NIS 4,001-5,000	NIS 3,501-4,000	NIS 3,001-4,000	
		5	NIS 5,001-6,000	NIS 4,001-5,000	NIS 4,001-5,000	
		6	NIS 6,001-7,500	NIS 5,001-6,000	NIS 5,001-6,000	
		7	NIS 7,501-10,000	NIS 6,001-7,500	NIS 6,001-7,000	
		8	NIS 10,001-14,000	NIS 7,501-10,000	NIS 7,001-9,000	
		9	NIS 14,001-21,000	NIS 10,001-14,000	NIS 9,001-12,000	
		10	more than NIS 21,000	more than NIS 14,000	more than NIS 12,000	
		0	No Salary	No Salary	No Salary	Calculated by Age

2. <u>Life satisfaction variance within districts:</u>

District	*Variance in district*
1	*0.020907023*
2	*0.014703051*
3	*0.016477037*
4	*0.007163083*
5	*0.00878997*
6	*0.017283899*
7	*0.055054839*
Average	***0.020054129***

3. Table 9a: Testing variation in the dependent variable using the panel data set and a linear model

Table 9a: Robustness for Life satisfaction Variable - Linear Model (Panel data)

	2	3	4	2	3	4
Dependent variable: Life Satisfaction 2-2						
Casualties Within District (last month)	-0.0018*	-0.0019*	-0.0018*			
	[0.0008]	[0.0008]	[0.0008]			
Religious* Casualties Within District (last month)	0.0034**	0.0032**	0.0034**			
	[0.0011]	[0.0011]	[0.0011]			
Killed From District (last month)				-0.0033**	-0.0036**	-0.0034**
				[0.0012]	[0.0012]	[0.0012]
Religious*Killed From District (last month)				0.0062***	0.0058***	0.0061***
				[0.0017]	[0.0016]	[0.0016]
_cons	0.9039***	0.8802***	0.7592***	0.9041***	0.8812***	0.7606***
	[0.0242]	[0.0261]	[0.0318]	[0.0242]	[0.0261]	[0.0317]
Year	Yes	Yes	Yes	Yes	Yes	Yes
District	Yes	Yes	Yes	Yes	Yes	Yes
N	1970	1956	1954	1970	1956	1954
adj. R^2	0.201	0.2	0.222	0.203	0.202	0.224

$^+ p < 0.1$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$. Standard errors in brackets. Data set: Panel data for the religious and secular population.
Fixed effect regression model: (Life Satisfaction 2-2)d,r,t = α + β1(Terror Variable)d,t-1 + β2(Religious) d,r,t *(Terror Variable)d,t-1 +γReligiousd,r,t + δX d,r,t +λYear +ρDistrictd +ε d,t
Additional baseline regression control variables included as used in Table 4 and Table 7. Specification can be compared by column number.

4. <u>"Lone Wolf" life satisfaction survey questionnaire:</u>

<div dir="rtl">

<u>שביעות רצון והמצב המדיני ביטחוני</u>

<u>שאלות רקע כלליות</u>

1. שם היישוב בו את/ה גר/ה: ـــــــــــــــــ
2. שם היישוב בו את/ה עובד/ת: ـــــــــــــــــ
3. מין:
   a. זכר
   b. נקבה
4. גיל: ـــــــــــــــــ
5. ארץ לידה:
   a. ישראל
   b. אחר ـــــــــــــــــ
6. שנת עליה (אם רלוונטי): ـــــــــــــــــ
7. מצב משפחתי:
   a. נשוי/אה
   b. רווק/ה
   c. גרוש/ה
   d. אלמן/ה
   e. אחר
8. לפני כמה שנים התחתנת (בנישואיך האחרונים, אם רלוונטי): ـــــــــــــــــ
9. האם נולדו לך ילדים (מכל נישואיך, וכולל ילדים מחוץ לנישואים אם רלוונטי):
   a. כן
   b. לא
10. האם אתה:
    a. יהודי
    b. אחר
11. האם אתה:
    a. דתי
    b. לא דתי
12. כיצד היית מגדיר את רמת הדתיות שלך:
    a. חרדי
    b. דתי
    c. דתי לאומי
    d. מסורתי
    e. חילוני
    f. אחר ـــــــــــــــــ
13. האם את/ה (אם רלוונטי):
    a. חוזר בתשובה
    b. חוזר בשאלה
14. מאיזה עדה את/ה:
    a. אשכנזי
    b. ספרדי
    c. מעורב
    d. אחר ـــــــــــــــــ
15. השכלה פורמלית: מה התעודה או התואר הגבוהה ביותר שקיבלת?
    a. לא למדתי כלל במוסד לימוד
    b. תעודת סיום של בית ספר תיכון

</div>

c. תעודת בגרות

d. תעודת סיום של בית ספר על תיכוני שאינה תעודה אקדמית

e. תואר ראשון או תואר מקביל

f. תואר שני או תואר מקביל (כולל ד"ר לרפואה)

g. תואר שלישי או תואר מקביל

16. מס' שנות לימוד:_____

17. האם שרתת בצה"ל:

a. כן

b. לא

c. אני עדיין בשירות צה"ל

18. האם היית לוחם קרבי (במידה ורלוונטי):

a. כן

b. לא

19. האם עשית שירות לאומי:

a. כן

b. לא

c. אני עדיין בשירות לאומי

20. מצב תעסוקה:

a. מועסק

b. אחר

21. בחודש שעבר מה הייתה הכנסתך (הכנסת משק בית משותפת, ייחד עם בן/ת זוגך במידה ויש) ברוטו:

a. אין הכנסות

b. עד 2,500 ש"ח

c. 2,501 עד 4,000

d. 4,001 עד 5,000

e. 5,001 עד 6,500

f. 6,501 עד 8,000

g. 8,001 עד 10,000

h. 10,001 עד13,000

i. 13,001 עד 17,000

j. 17,001 עד 24,000

k. 24,001 או יותר

<u>שביעות רצון, פחד וחששות</u>

1. באופן כללי, האם את/ה מרוצה מחייך:

a. בכלל לא מרוצה

b. לא כל כך מרוצה

c. מרוצה

d. מרוצה מאוד

2. האם את/ה מרוצה ממצבך הכלכלי:

a. בכלל לא מרוצה

b. לא כל כך מרוצה

c. מרוצה

d. מרוצה מאוד

באופן כללי האם את/ה מרוצה מהאזור בו את/ה גר:

a. בכלל לא מרוצה

b. לא כל כך מרוצה

c. מרוצה

d. מרוצה מאוד

3. האם את/ה מרגיש/ה בטוח ללכת לבד בשעות החשיכה באזור בו את/ה גר/ה:

a. בכלל לא בטוח

b. לא כל כך בטוח

c. בטוח

d. בטוח מאוד

4. מה מצב בריאותך בדרך כלל:

a. בכלל לא טוב

b. לא כל כך טוב

c. טוב

d. טוב מאד

5. האם היית מגדיר את עצמך כבעל אופי פחדן או חששן:

a. כן

b. לא

שביעות רצון ופחד לנוכח גל הטרור הנוכחי

1. האם את/ה מרגיש תחושת פחד לאור המצב הביטחוני כיום:

a. לא

b. לעתים רחוקות

c. כן

2. האם היית לאחרונה בקרבה למקום פיגוע בזמן שהוא התרחש:

a. כן

b. לא

3. האם את/ה מכיר/ה באופן אישי מישהו שנפצע או נהרג בפיגוע לאחרונה:

a. כן

b. לא

4. האם היה לאחרונה פיגוע במקום בו את/ה עובר/ת לעתים קרובות:

a. כן

b. לא

5. האם היה לאחרונה פיגוע במקום בו את/ה עובד/ת:

a. כן

b. לא

6. האם היה לאחרונה פיגוע באיזור מגוריך:

a. כן

b. לא

7. האם את/ה נמנע/ת מללכת למקומות מסוימים עקב המצב הביטחוני:

a. כן

b. לא

8. האם את/ה נמנע/ת משימוש בתחבורה ציבורית עקב המצב הביטחוני:

a. כן

b. לא

9. האם את/ה נמנע/ת מללכת לבתי קפה ומסעדות עקב המצב הביטחוני:

a. כן

b. לא

10. האם את/ה מרגיש/ה שהמצב הביטחוני משפיע על רמת שביעות הרצון שלך מהחיים באופן כללי:

a. כן

b. לא

11. האם את/ה מרגיש/ה שהמצב הביטחוני גורם לך ללחץ לא שיגרתי:

    a. בכלל לא

    b. לא

    c. כן

    d. ממש

12. במצב הנוכחי, את/ה חושב/ה שהסיכון שלך להיפגע בפיגוע הוא:

    a. כלל אין לי סיכון

    b. הסיכון הוא קטן

    c. הסיכון הוא בינוני

    d. יש לי סיכון גדול

13. האם לאור המצב הביטחוני את/ה בודק ומתעדכן/ת בחדשות בתדירות גבוהה יותר:

    a. לא

    b. כן

<u>פחד מטרור באופן כללי</u>

1. בדרך כלל, כאשר אין גל טרור או מלחמה האם אתה מפחד מטרור:

    a. לא

    b. לעתים רחוקות

    c. כן

2. האם אי פעם היית סמוך למקום פיגוע או מעורב/ת בפיגוע:

    a. כן

    b. לא

3. האם את/ה מכיר/ה באופן אישי מישהו שנפצע או נהרג בפיגוע:

    a. לא

    b. כן

4. באופן כללי האם את/ה נוסע או מסתובב באזורים שהם מעבר לקו הירוק:

    a. לא

    b. לעתים רחוקות

    c. לעתים קרובות

    d. כן, אני גר מחוץ לקו הירוק

5. כשאת/ה חושב/ת אחורה לתקופת האינתיפאדה השנייה את/ה נזכר/ת בכך ש:

    a. לא פחדת

    b. פחדת קצת

    c. פחדת מאוד

6. באיזו תדירות את/ה בדרך כלל קורא ומתעדכן בחדשות:

    a. לעתים רחוקות

    b. לעתים תכופות

    c. כל הזמן

<u>תחושת ביטחון כתוצאה ממדיניות ממשלתית</u>

1. האם את/ה חושב שהמדיניות הממשלתית מצליחה לספק תחושת ביטחון באופן כללי:

    a. כן

    b. לא

2. האם את/ה חושב/ת שהמדיניות הממשלתית מצליחה לספק תחושת ביטחון בגל הטרור הנוכחי:

a. כן
b. לא

3. האם את/ה חושב שכוחות הביטחון מצליחים לספק תחושת ביטחון באופן כללי:
    a. כן
    b. לא

4. האם את/ה חושב/ת שכוחות הביטחון מצליחים לספק תחושת ביטחון בגל הטרור הנוכחי:
    a. כן
    b. לא

5. האם את/ה חושב שבישראל שיהודים ישראלים התרגלו לחיות עם הסיכון לטרור:
    a. לא
    b. כן, אבל רק במצבים בהם הטרור לא פוגע בשגרה היום יומית
    c. כן, תמיד

6. כיצד היית מגדיר את עצמך מבחינת עמדות פוליטיות?
    a. ימני
    b. ימין-מרכז
    c. מרכז
    d. שמאל-מרכז
    e. שמאלני

7. למי הצבעת בבחירות אחרונות:
    a. _____
    b. מעדיף שלא לענות