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Shifali Baliga 4/15/2011

Are Jewish Religious Holidays Factors in the Timing of Terrorist Attacks in Israel?

by

Shifali Baliga

Dr. Dan Reiter
Adviser

Department of Political Science

Dr. Dan Reiter

Adviser

Dr. David Davis

Committee Member

Dr. Kyle Beardsley

Committee Member

Dr. Valerie Loichot

Committee Member

4/15/2011

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Abstract

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The purpose of this paper is to investigate whether Jewish religious holidays are a factor in the timing of terrorist attacks in Israel. The research will explore the relationship between the independent variable (religious holidays as a whole as well as individual religious holidays) and the dependent variable (terrorist attacks in Israel from 1970-2007) to examine whether a causal linkage can be established between religious holidays and terrorism. The methodology employed in this research is predominantly quantitative and tested within the statistical program STATA, but it is also supplemented with qualitative analysis. My primary dataset comes from the University of Maryland's Global Terrorism Dataset. The main findings of the research conclude that there is no causal linkage between religious holidays as a whole and the timing of terrorist attacks in Israel. However, the research does establish that there is a causal connection between Passover and the timing of terrorist attacks. Essentially, terrorist organizations strategically choose to attack on Passover because it optimizes both their intermediate goals (casualties, fear, economic damage, etc.) and their ultimate goal (policy change). The paper draws several main conclusions: 1) Passover's effect on the timing of terrorist attacks is statistically and substantively significant, 2) in conjunction with the effect of Passover, other variables such as impending peace talks contribute to the timing of terrorist attacks, and 3) terrorist organizations will sometimes also strive for unpredictability in the timing of their terrorist attacks.

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The Research Question

On April 17th, 2006 during the Passover holiday, a militant young Palestinian blew himself up and killed eleven others and injured countless more in a small restaurant in Tel Aviv. There were many factors that led to the attack carried out by the Islamic Jihad, a small terrorist organization. News reports noted that the shawarma restaurant was packed with people for lunchtime during the Passover holiday. At first glance, it seemed likely that terrorists chose to attack on that date because of the Passover holiday. Other reports emerged stating that the same restaurant was attacked on January 19th of the same year, possibly indicating that the choice to attack had more to do with the ease of attack rather than the significance of Passover. Further reports brought to light that the resistance group Hamas took control of the Palestinian Authority just nineteen days earlier on March 30th. Thus, upon further examination, it seemed as if the timing of the terrorist attacks was a result of Hamas wanting to show its strength early in its term. At the same time, the large lunchtime crowd was attributed to the Passover holiday, indicating that the strategic choice to attack was in part a function of the holiday. All together, the news reports painted an inconclusive picture as to whether the Passover holiday was a central factor in the choice to attack the restaurant on that particular date.

The articles left unquestioned several important questions for Israeli anti-terrorism measures: Are religious holidays a factor in the timing of terrorist attacks in Israel? Are terrorist attacks in Israel committed by terrorist organizations more likely to happen during Jewish holidays than on days without such religious

holidays? Specifically, is the occurrence of a Jewish religious holiday a factor that affects the timing of terrorist attacks? Although Israel has grappled with these questions for decades, the focus of global terrorism in the United States emerged as a result of the attacks on the World Trade Center and the Pentagon on 9/11. Although 9/11 is cited as a random attack, the U.S. government and other Western governments continue to research terrorist strategies to construct anti-terrorism measures. The end result is often a cat-and-mouse game, where the advantage constantly shifts between the governments and the terrorist organizations. The government isolates factors that contribute to the timing of attacks, the choice of target or location, and the method of weapon and subsequently institutes policies to prevent such attacks. Then, the terrorist organization creates new methods by which to attack, thereby perpetuating this cycle.

Unlike some of the Western states, Israel is a prime case to study such anti-terrorism measures because they have combated terrorism since the creation of the state of Israel. Although there have been approximately 132 attacks during Jewish religious holidays over the past four decades in Israel, it is difficult to establish whether the religious holidays were a direct factor in these attacks or whether other factors were at play. Although this unexplored question will yield real world consequences on policy, the role of religious holidays as a factor in terrorist strategy is understudied. The goal of this paper is to test empirically whether terrorist attacks are more likely to happen on Jewish religious holidays than on any other day. The outcome of this question relates to larger issues such as Israel's counterterrorism policy and whether on days of religious holiday, the government

should utilize more defense resources and instate more stringent security measures to prevent attacks.

The framework of the question is limited to the region of Palestine and Israel due to feasibility. The case of Palestine and Israel is rich in both the quantity and quality of data available. The larger framework for the research question encompasses the idea that the periodic occurrence of religious holidays is a factor that affects timing of terrorist attacks because there are certain strategic advantages or disadvantages that result from the holiday. This theory rests on another crucial theory, which states that terrorist organizations and individual terrorists are rational thinkers who carry out terrorist attacks strategically. This implies that terrorists are not only or not primarily driven by emotional instability or unrestricted religious fervor. Instead, they use strategy and rationality in picking the dates, locations, and populations that they think will harm the most people, induce the most fear, and increase their chances of gaining power.

As noted above, the findings from the research question will yield real world consequences on policy. Undoubtedly, terrorism poses a global threat from which governments must protect their citizens. Terrorism is at the heart of several major wars in the world today and characterizes many of the bitterest struggles for political and religious domination. Since the attacks on U.S. soil on 9/11, the role of terrorism has definitively impacted not only American citizens, but also citizens around the globe. It has instilled both anxiety and fear in citizens, and governments' top priority has become the prevention of terrorism to protect their states. Thus, governments are constantly searching for facts that affect both the timing and

motivation for terrorist attacks so that they can identify and take measures to mitigate the occurrence of those factors.

Although religious holidays have not been significantly examined as a factor in the timing of terrorist attacks, they could affect the strategic choices for dates, locations, and populations for attacks. For example, if on a particular religious holiday, most police officers are granted holiday, then the security overall has been lessened and it might be a strategically ripe time to execute the attacks. We expect that religious holidays create certain unique circumstances that are beneficial for terrorist organizations to fulfill their intermediate goals. In this light, the hypothesis is that Jewish religious holidays have a significant effect on the timing of terrorist attacks in Israel.

The empirical results from the testing show that religious holidays as a whole are not factors in the timing of terrorist attacks, but that the holiday of Passover is both a statistically significant and substantively significant factor in the timing of terrorist attacks. First, the paper will strive to examine why religious holidays as a whole do not impact the timing of terrorist attacks. Secondly, the paper will explore why Passover, specifically, is such a significant factor in the timing of terrorist attacks in Israel. In addition, the paper will also put forth the argument that the cat and mouse game that characterizes the actions of terrorists and the state government could impede a consistent pattern of terrorist attacks during religious holidays. Finally, this paper will evaluate the role of unpredictability or randomly timed attacks as a strategy for terrorist success and whether attacking on religious holidays can fit into this strategy or whether it is antithetical to the strategy.

The Literature Review

Defining Terrorism

The research focuses on the effect of religious holidays on the timing of terrorist attacks. Therefore, much of the literature is connected to terms such as "terrorism," "terrorist attacks," and "terrorists." However, these terms have varied definitions and connotations that can affect the research findings. There are several types of terrorist groups, ranging from religious based to political based. Even though this paper is examining religious holidays as factors affecting the timing of terrorist attacks, the data are not solely limited to attacks carried out by religious terrorist organizations. Thus, this paper will examine political terrorist organizations in the definition of key terms. Why? Terrorist organizations, whose primary motivation may not be religious in nature, might still see religious holidays as either a strategically good or strategically bad day to attack. On a psychological basis, attacks on religious holidays may induce greater fear and anxiety among the target population. On a purely strategic basis, religious holidays cause larger groups to gather in centralized locations, thereby compounding the choice of target population and location. Therefore, political based terrorist groups choose to carry out attacks during religious holidays or choose not to do so for strategic advantages or disadvantages, not necessarily reasons connected to religious fervor.

Over the last three to four decades, scholars and subsequently governments have constructed a standard definition of "terrorism". Although each state may vary the definition in its legal codes and although each state may interpret certain attacks as terroristic in nature or not, there are three prevailing features that characterize

terrorism. One definition is that terrorism is "politically motivated violence against noncombatant targets by subnational groups or clandestine agents, usually intended to influence an audience" (Ruby 2002, 10). Thus, terrorism involves acts that are perpetrated for political reasons. However, other standard definitions expand this definition to include, "a violent act aimed at attaining political, economic, religious, or social goal" (Global Terrorism Database). Second, it must be targeted against noncombatants or civilian forces as opposed to military forces. Finally, subnational or clandestine groups, as opposed to governments of states, must execute such attacks. These three features, particularly the third criterion, distinguish terrorist attacks from war. An additional aspect of terrorism involves terrorists' motivations to induce fear in the public in order to achieve political gains or influence the policies of certain governments (Ruby 2002, 10; Bongar 2007, 10).

Does this definition of terrorism fit the case of Palestinian terrorist attacks on Israeli targets? One of the most prominent Palestinian terrorist organizations is Hamas, a Palestinian Islamist socio-political organization, which currently constitutes a majority in the Palestinian Parliament. Hamas is internationally recognized as a terrorist organization because it uses terrorist attacks against Israeli non-combatants and Israeli non-military citizens to achieve political goals. Indeed, the major political goal of Hamas is the replacement of the Israeli and the Palestinian territories with an Islamic Palestinian state. Thus, its attacks are designed to weaken the Israeli military and induce fear in the Israeli people to the extent that Israel will have no choice but to give back the territories seized during the various Arab-Israeli wars. More radically, the goal of Hamas is to eradicate the

very existence of the state of Israel. Although several leaders have not ruled out the possibility of a two-state solution, Hamas' rhetoric involves the eradication and dissolution of Israel. Without a doubt, Hamas fits into the first two criteria to be defined as a terrorist organization. However, the third criterion—that terrorism is executed by subnational or clandestine organizations-- is questionable in the case of Hamas, which constitutes the largest majority in the government, overtaking Fatah and the Palestinian Liberation Organization (PLO). It seems as if Hamas' attacks are targeted at noncombatants and are for the purpose of achieving political gains. How do we account for the fact that they are elected members of the government? Does this mean they are not subnational or clandestine? As scholar Glenn Robinson explains, Hamas has a plethora of different factions and wings (Robinson 2004, 112 and Mandaville 2007, 202). These include the government wing, the social relief and social works wing, and finally, the fundamentalist violent wing. While scholars such as Peter Mandaville build upon Robinson's work to assert that Hamas' various wings, particularly its function as a social movement, challenges its characterization as a terrorist organization, there are arguments that it is difficult to isolate each of these wings from the other. Therefore, while the social works wing of Hamas may not be involved in the planning and execution of terrorist attacks, the fact that it is a part of an entire movement whose goal is the eradication of Israel by means of terrorist tactics results in the classification of Hamas as a terrorist organization for this study.

The Theory Behind Religious Holidays as a Factor in the Timing of Terrorist Attacks

The primary theory sustaining the hypothesis that religious holidays are a significant factor in the timing of terrorist attacks is that terrorist attacks are not carried out indiscriminately, but are marked by strategy (Roislien and Roislien 2010, Chasdi 1997, Bloom 2007). The theory rests on the assertion that terrorist attacks are carried out in a rational manner and that consequently, one will find a pattern of the logic of Palestinian terrorist target choices against Israel. This theory supports the hypothesis that terrorist groups choose to attack on religious holidays based on the assumption that attacking on religious holidays is a logical, strategic choice that can maximize a goal of the group as opposed to a purely emotional motivation. Contrastingly, many politicians have depicted terrorists as uneducated, impoverished individuals who are not driven by rationality or strategy, but purely emotional motivations. However, on an individual basis, there is no correlation or causation between the economic status of an individual and his or her likelihood to be a terrorist (Krueger 2007, 13).

The above noted theory, also known as rational choice theory, employs a narrow definition of "rationality" that means that an individual acts to balance costs against benefits to arrive at an action that maximizes personal advantage (Scott 2000). According to rational choice theory, the notion of rationality does not invoke normative definitions of acts such as moral or immoral. Accordingly, rational choice assumes that actors act to maximize utility, and do not prefer or reject actions on the basis of the morality of the actions. Consequently, the theory proposes that terrorist organizations harm citizens in order to force the state to change its policies towards a certain group, in this case towards the Palestinians. Finally, terrorist

organizations believe that their use of violence against civilian targets maximizes their intermediate goals such as fear, the number of fatalities, publicity, or economic damage, in order to achieve their ultimate goals, such as policy change.

The strength of the rational choice theory lies in its generalizability. Although various authors contextualize the theory within their specific case studies, it has been tested against additional cases and has proven to hold true for these cases. For example, the theory that terrorists act rationally is used to support the claims that Palestinian terrorist groups use logic while choosing Israeli targets (Roislien and Roislien 2010) to harm the most people, Chechen rebel forces isolate specific targets in a logical manner to induce psychological fear (McCartan 2008), and the ETA (a Basque nationalist and separatist terrorist organization) does not choose target locations randomly (Barros 2007). Thus, many scholars researching both the timing and motivations of terrorist groups have employed the theory to explain terrorist behavior in their respective papers for several different reasons. Most importantly, if we can identify patterns in their logic, it can give us greater confidence in establishing systematic rationale for the timing of terrorist attacks (Enders and Sandler 1993, 829). Furthermore, if we can find such patterns, it can give us greater confidence in the validity of our theoretical assumptions, such as the assumption that attacking on religious holidays maximizes the success of the intermediate goals of the terrorist organization. This paper will evaluate whether religious holidays are in fact a part of this systematic rationale within the broader theory that terrorist organizations' attacks are marked by strategy as opposed to non-strategic randomness.

Religious holidays may be a strategic factor that affects the success of terrorist organizations' attacks. The religious holiday factor, if it indeed affects terrorist organizations' choice of attacks, primarily affects their timing, but it also affects the choice of location (i.e. places of worship) and the target population (i.e. people who congregate in areas of worship). For example, Bloom explains that groups such as Hamas and the Islamic Jihad target locations that are public venues with a high population (Bloom 2007, 35). Religious holidays may produce such conditions. For example, they attract a large number of people around places of worship. Nonetheless, the rational choice theory does not necessarily support the claim that any such change in the variation in the independent variable (whether there is a religious holiday or not) will produce variation in the dependent variable (whether there is a terrorist attack or not). The literature on terrorism lacks any theory that claims to establish this causal connection between the presence of religious holidays and its variation on the occurrence of terrorist attacks. Indeed, the study will pick up where the literature is deficient to build upon the terrorist rational choice theory to test whether such a causal connection occurs between religious holidays and the timing of terrorist attacks.

From the terrorist rational choice theory, we can extrapolate that the strategic process of terrorists involves the concept that religious holidays create a unique set of circumstances that will affect the success of the terrorist ploy in question. Although an examination of the literature has not definitively established any sort of causal connection between the occurrence of religious holidays and its effect on terrorist attacks, it is possible to use induction to build such a theory.

There are several examples of the state strategically using religious holidays to either call for a peace or to execute an attack. Although this paper is examining terrorist organizations as opposed to the state, we can use the example of the state to strengthen the notion that terrorist organizations will act similarly because rationality characterizes both of their decision-making processes (Green, 22). One prominent example of this is the Arab decision to attack Israel on Yom Kippur. The Egyptian and Syrian armies attacked Israel on Yom Kippur in 1973. Because it is the holiest day of the Jewish year, many soldiers were in religious services during the attack and consequently, the Arab armies made considerable strides invading Israel's borders in both the north and the south (Scharfstein 1994, 116). The symbolic and psychological effect of attacking on Yom Kippur induced a greater sense of fear among Israeli citizens. At the same time, the holiday produced circumstances such as lower military security that made it a strategically ripe time for the Arab armies to make greater advances than they would have if the level of military personnel was heightened. Thus, it is important to also look at the trends in the data for the effect of religious holidays on the occurrence of terrorist attacks. For example, after the 1973 war, the Jewish state was more likely to bolster security on Yom Kippur and other major Jewish holidays. Similarly, we might expect to see the same effect with terrorist attacks. Indeed, the literature supports this notion. Enders and Sandler, analyzing the time series properties of the various attack modes used by transnational terrorists, found that states react strategically to terrorist attacks by isolating the cause of the attacks and then bolstering security against those causes (Enders and Sandler 1993). Therefore, while the research may establish that

terrorists attack Israel more on Jewish holidays than on days that have no holidays, the state may offset that security threat by bolstering security around the holidays. Thus, if they do bolster security, the causation link could disappear.

The literature supports the theory that religious holidays create a unique set of circumstances that affect the success of terrorist attacks, which may be applicable specifically to the Israeli-Palestine case. Roislien's paper, entitled, "The Logic of Palestinian Target Choice", concludes that Palestinian terrorist attacks against Israeli targets are executed in a strategic, logical, and rational manner as opposed to terrorist attacks that are carried out indiscriminately (Roislien and Roislien 2010). In order to support the hypothesis that religious holidays are a factor in the timing of terrorist attacks, we must establish that religious holidays play into the strategic process by which terrorists or terrorist organizations choose their dates, locations, and targets. In order to prove this, we must assume that rational choice theory explains Palestinian terrorist organizations' behavior, an assumption Roislien establishes in his work. The paper also concludes that there are patterns in the attacks against Israel, which bolsters the idea that certain factors consistently affect terrorists' choices to target on a certain date, location, or population.

How Do Terrorist Groups Choose the Location and Timing of Attacks?

The general theoretical "issue of the "rationality"" of terrorist groups provides the context that terrorist groups choose the location and timing of their attacks strategically as opposed to indiscriminately or arbitrarily. Nonetheless, we still need to establish the specific, concrete ways in which terrorist groups choose their targets. Roislien concludes that the location of the targets is an indicator of the

amount of casualties as a result of the attacks. For example, in his examination of Palestinian terrorist organizations' target choices, he finds that there are two separate patterns of target choice. One is inside the state of Israel, where terrorist groups often use suicide bombings and other tactics that harm or kill large amounts of people and the other is in the Occupied Territories, where terrorist groups use targeted assassination, killing a smaller group of people. Furthermore, the terrorist groups do not attack all settlements in the Occupied Territories—they only choose the settlements that are ideological in nature and have Jewish-national religious overtones (Roislien and Roislien 2010). Why do Palestinian terrorist groups differentiate between these two locations? The author explains that it is much more difficult for the terrorists to escape after carrying out an attack in the actual state of Israel, thus suicide methods are most often used, killing large amounts of people with relatively little resources. Because it is more difficult to successfully carry out an attack in Israel, terrorist groups want to use the least amount of resources necessary so that if the attack fails, they will not lose a large amount of resources. However, in the Occupied Territories, the overcrowded streets are those most often used by Israeli settlers and soldiers. Terrorists view them as easy targets and are thus more likely to use shooting as a method. They are able to escape afterwards because of the crowded and chaotic nature of the settlements' streets. Thus, there is no need for them to use suicide bombings because they are able to escape. In conclusion, Roislien finds that the choice of target is directly related to two main concepts: 1) ease of the execution and ability to escape the attack and 2) in the

Occupied Territories, territories established with ideological or Jewish/ religious associations are more likely to be attacked.

The literature is lacking in its examination of the timing of Palestinian terrorist attacks. Although there is some substantive detail regarding the timing of ETA attacks in Spain, it is important to note that ETA attacks differ quite radically from Palestinian terrorist attacks. For example, unlike the goal of Palestinian terrorist organizations, the goal of the ETA is not to carry out deadly attacks that result in a large amount of fatalities, which is associated with less public support for the organization (Barros 2006, 344). Furthermore, in terms of timing, whenever the ETA murders people, there is a later decrease in the likelihood of a terrorist attack occurring, meaning that murder is associated with a decrease in the likelihood of the hazard over the period of time of the duration model of the length of time between terrorist attacks (Barros 2006, 344). In other words, when the ETA murders targets, the time between that attack and the next ETA attack is longer than when the ETA employs other methods of attacks. However, these findings are limited to the case of the ETA in Spain. The author of the case study also finds that ETA attacks increase in the summer, mostly due to the negative impact terrorism has on the tourism industry. This negative economic ripple effect means that governments are more likely to listen to the demands of the ETA in this particular case. Thus, we might see the same parallel occurring in Israel, where there is a large amount of tourism during the summer and where the psychological impact of terrorist attacks might be the greatest.

Alternative Targeting Strategies

As noted above, there exist several different plausible goals of terrorist activity. For example, terrorist organizations want to maximize fear, number of casualties/injured persons, publicity, and/or public support. However, these results represent strategies, plans of action to attain the goals, as opposed to the goals, which are the ultimate desires of the organizations. Terrorist organizations' goals vary in terms of the reasons for and extent of the conflict. Nonetheless, Kydd and Walter argue that the goals of nearly all terrorist activity in the past century falls into one of five categories: 1) regime change, 2) territorial change, 3) policy change, 4) social change, and 5) status quo maintenance (Kydd and Walter 2006, 52). According to Kydd and Walter, Palestinian terrorist activity, primarily that of the terrorist organization Hamas, is carried out to ultimately achieve territorial change and then regime change.

In addition to the five predominant goals of terrorist activity, terrorist organizations execute one or more of five overarching strategies to reach these goals: 1) attrition, 2) intimidation, 3) provocation, 4) spoiling, and 5) outbidding (Kydd and Walter 2006, 59-78). Attrition is a strategy based on terrorist organizations maximizing the costs they inflict on the target to demonstrate their credibility to inflict future costs (Kydd and Walter 2006, 59-60). Intimidation, which is similar to deterrence, involves preventing undesirable behavior by means of costly signals and threats (Kydd and Walter 2006, 66). Provocation is a strategy designed to convince the public that the target of the attacks is untrustworthy and must be stopped at all costs (Kydd and Walter 2006, 69). Spoiling is a strategy to disrupt the peace between moderate terrorist leaders and leaders in the

government (Kydd and Walter 2006, 73). Finally, outbidding is a strategy used by terrorist organizations when there are competing terrorist organizations that want to lead a unified movement against the government (Kydd and Walter 2006, 76). In order to win over the other organization, the terrorist organization becomes more zealous and extreme than the other organization(s).

The predominant strategy that each terrorist organization uses varies depending on the situation and the goal it is trying to achieve. For example, the ETA in Spain uses provocation, a strategy designed to help shift citizen support away from the incumbent regime (Kydd and Walter 2006, 69) to induce regime or territorial change. In this strategy, the terrorists achieving their end goals depend upon the support of the public. The ETA uses provocation to provoke the Spanish government to respond to their terrorist attacks with harsh violence, which in turn results in the radicalization of the population who ultimately support the terrorist organization. In this light, when the ETA attacks result in public casualties, support for the organization decreases dramatically and hurts the organization. On the other hand, Palestinian terrorist organizations use attrition to achieve their goal of territorial and regime change. Unlike provocation, attrition depends on demonstrating to the public and to the target state that the organization is strong and willing to inflict serious costs on the public. In this case, the goal is to convince the government more than the public that the organization is willing to go to extreme lengths to maximize the costs to the targets. Thus, organizations, such as Hamas, are willing and want to produce the most number of casualties and injuries on a target population.

It is clear that Palestinian terror activity against Israel is designed to maximize fear and the number of fatalities as opposed to maximizing public civilian support of the organizations themselves. The role of maximizing publicity is crucial too in the strategy of attrition because the terrorist organizations want the masses to understand how far they are willing to go in order to achieve their goals. By attacking on Jewish religious holidays, Palestinian terrorist organizations will maximize fear because emotions are heightened during religious holidays. Additionally, it seems likely that they will be able to maximize the number of fatalities because people are generally clustered in centralized locations such as synagogues. At the same time, we must take into account the role of heightened security on Jewish religious holidays and how this heightened security will impede the execution of a successful attack. With limited resources, terrorist attacks cannot afford to fail both economically and figuratively. This is especially pertinent in the attrition strategy because each time a terrorist attack fails, it reinforces to the public and to the target government that the organization is disorganized, not strong enough, and that the targets do not need to fear such organizations or at least do not need to fear them to the same degree. As a result, one competing hypothesis is that Palestinian terrorist organizations attack on days of no particular significance or days in which there is no heightened security. Similarly, they may choose to target locations that do not carry with them any special significance as opposed to synagogues or Jewish community centers, which often have security measures in place to guard against terrorist attacks.

In addition, fear, one of the primary goals of terrorist organizations, may be exacerbated in citizens if an attack occurs at a time when they are not expecting one. Religious holidays may be occasions when such fear is greater. Thus, terrorist attacks carried out on "normal" days at "everyday" locations such as markets, schools, and malls may be more effective in the terrorist goal of attrition. This reinforces support for the competing hypothesis that Palestinian terrorist organizations attack on days of no particular significance or days in which there is no heightened security.

Economics as a Factor Affecting the Timing of Terrorist Attacks

The literature supports the notion that in some cases, economic considerations may affect the timing of terrorist attacks. For example, in the case of Northern Ireland, scholar James Honaker finds that a higher Catholic unemployment rate in Northern Ireland caused greater Republican paramilitary violence (Honaker 2005, 22). There are several different theoretical underpinnings for such a causal mechanism. First, by being unemployed, individuals have more time to plan and execute attacks. Second, the very nature of being unemployed increases antagonism towards the state and increases frustrations. Third, involvement in terrorist organizations and the execution of attacks can lead to monetary compensation, which is significant to our analysis if people are struggling economically. Thus, terrorist organizations can recruit people to their cause by providing monetary compensation in times of economic downfall. However, numerous other studies, especially studies of Islamic terrorism, have shown that terrorists are usually well-educated, middle class individuals (Bloom 2007). In case there is any sort of impact

or causal connection, economics (unemployment rate and GDP per capita at US constant dollars in the Occupied Palestinian Territories) will be held as a control variable in the analysis of Palestinian terrorist activity over the past several decades.

Methodology

The literature shows that scholars have used various methodologies to test the rational choice theory for both individual terrorists and terrorist organizations. However, the literature is lacking any sort of empirical testing of the effect of religious holidays on the incidence of terrorist attacks. There is no definitive quantitative or qualitative test that has tested whether religious holidays are more likely or less likely to decrease the chances for a terrorist attack. Therefore, detailed below are a plethora of other ways in which scholars tested the impact of various other factors on the timing of terrorist attacks and the choice of target.

Several studies utilized a purely quantitative approach to examine either the logic of terrorist target choices or the timing of attacks. For example, the authors of one such article employed a quantitative analysis in determining both the logic of the target choice and the logic of the timing in the case of Chechen-Russian conflict (McCartan et al 2008). One of the authors' hypotheses was that civilian targets were more likely to be bombed in Russia than in Chechnya. They utilized a quantitative approach by taking a sample of 168 Chechen bombings and coding them as against civilian targets or non-civilian targets, and also coding them as Russian civilians or Chechen civilians. Using regression methods, they determined that that there was a statistically significant difference between Russian civilians and Chechen civilians

being targeted in the attacks. Russian civilians were much more likely to be targeted, which is consistent with terrorist rational choice theory, because if the Chechen rebels targeted Chechen civilians, they would alienate and reduce public support for their cause. Drawing upon this methodology, the research can include a similar quantitative analysis with both my independent and dependent variable being binary variables. However, because the variables are binary, a different type of statistical analysis, detailed in the *Research Design* section, will be used.

Statement of Hypotheses

The primary hypothesis is as follows:

Hypothesis 1: Palestinian terrorism against Israeli targets will increase during the Jewish religious holidays.

Null hypothesis: There is no relationship between Jewish religious holidays and the timing of terrorist attacks.

Research Design

Measuring the Independent Variable

The independent variable, Jewish religious holidays, will be limited to the Jewish religious holidays that the state of Israel recognizes as official holidays. There are several official holidays included in the analysis including Purim, Passover, Israel Independence Day, Rosh Hashanah (the New Year), Yom Kippur (Day of Atonement), Sukkot, Simchat Torah, and Chanukah (Festival of Lights) (World Travel Guide). However, out of these official holidays, Israel Independence Day, which is not a religious holiday but a national holiday, will be coded as a control variable in the analysis. Why only choose the "major" religious holidays and those

only recognized by the state of Israel? First, the theory supporting the hypothesis that Palestinian terrorist attacks increase during Jewish religious holidays assumes that the terrorist organizations are aware that there is a Jewish religious holiday. The crux of the argument is that terrorist organizations strategically decide to attack on these holidays because they create a set of circumstances favorable to maximizing both fear and number of fatalities. Thus, by including religious holidays that are official holidays, we are excluding minor Jewish religious holidays that are only observed by a small part of the Israeli population or religious holidays unfamiliar to Palestinian terrorists. Furthermore, these official holidays are followed by all the various types of religious movements within Judaism as well as secular Jewish Israelis, ensuring that they are widespread within the nation.

The Dependent Variable: Terrorist Attacks in Israel

The Global Terrorism Database (GTD), funded by the Pinkerton Global Intelligence Services and subsequently donated to the University of Maryland, includes information concerning over 87,000 terrorist attacks (Global Terrorism Database). One of the most comprehensive data bases available, the GTD has information on terrorist attacks in Israel from 1970-2008. Additionally, the GTD uses the same three criteria as mentioned in the literature review for the definition of terrorism. In addition to the dates or incidences of the attacks, the data set includes the number of fatalities and injured persons, the type of weapon used, the location, and the perpetrator. Thus, the dataset is instrumental in not only determining whether attacks occurred during Jewish religious holidays, but also the circumstances surrounding the execution of such attacks. After downloading the file,

the data was simplified to only include terrorist attacks in Israel during those dates, thereby excluding any data from terrorist attacks in any other country. Additionally, the variable "incident" (which measures the total number of attacks on a given date) in the original database was recoded to the variable "attack", a 0/1 variable for whether an attack occurred on a particular date.

Controls

To ensure that the variation in the religious holidays is causing the variation in the amount of terrorist attacks instead of another factor, several variables will be held constant. These variables include: 1) the economic condition of Palestinians in the occupied territories (West Bank and Gaza) as measured by gross domestic product (GDP) per capita in US constant dollars and unemployment, 2) Israeli Independence Day, which is a major national holiday, 3) the construction of the wall, known as the Israeli West Bank barrier, which has reduced suicide attacks by 90%, 4) the First Intifada, 5) the Second Intifada, 6) the first war with Lebanon, and 7) the second war with Lebanon. I held these variables constant because each of them could be a factor that increases or decreases the amount of terrorist attacks. For example, the literature supports the notion that economic downturns may increase terrorism; therefore, economics is being held constant. Secondly, terrorists would also be more likely to attack on Israeli Independence Day because of the symbolic nature of the holiday—thus, it is also being held constant. Finally, as we already discussed, the construction of the West Bank wall has reduced one aspect of terrorism, suicide attacks, by a staggering 90% (Bard 2010). To account for this decline and to ensure that it does not affect the test of the original hypotheses, the

wall will be coded as a dummy variable. It will be coded as 0 if the date is before July 1, 2003 and 1 if the date is after July 1, 2003 (when the Israelis finished constructing the first continuous segment of the barrier). In addition, the statistical model will control for the First and Second Intifadas because without controlling them, the model could yield skewed results for certain months of the year during which the Intifada attacks were the strongest. The First Intifada is coded as 1 if the date is between September 8th, 1987 and September 1993. The Second Intifada is coded as 1 if the date is between September 28th, 2000 and August 2005. Both of the Intifadas were a literal uprising of the Palestinian people against the Israeli government. Although this uprising was manifested in many ways, including civil disobedience and non-violent protest, frequent and severe terrorist attacks were common during this period. Similarly, the dates of the first and second war with Lebanon were held constant.

Finally, the literature supports the notion that there are seasonal variations that could be factors in the timing of terrorist attacks. For example, the results could show that certain religious holidays are factors in the timing of terrorist attacks. These holidays could all be clustered in one season and the real cause of the variation is due to the season and certain circumstances that are a result of the season as opposed to the religious holidays. Although this may be a factor, the four seasonal variables are not included as controls in the logit model because they do not cause a statistically significant increase in the log-likelihood of the results (See Appendix A). As noted above, the original thought behind including seasonal variables is that the timing of terrorist attacks may vary from season to season due

to changes in the rate of tourism. Thus, the statistical significance of a particular religious holiday could be attributed to the fact that it occurs during a particular season. However, from a theoretical standpoint, it is not necessary to include the seasons as variables in the model because the tourism spikes may be due to religious holidays, not necessarily the season, in the first place (Ministry of Tourism 2010).

In addition to the GTD, the economic data is provided by the World Bank statistical databank also known as "World Data Bank: World Development Indicators (WDI) and Global Development Finance", which has measures of the GDP per capita of the West Bank and Gaza from 1960-2008 and measures of the unemployment rate from 1995-2008.

Testing the Relationship

Both the independent variable and the dependent variable for testing the hypothesis are binary variables. The primary statistical model to test the relationship between Jewish holidays and the timing of terrorist attacks is the multivariate logit regression model, which estimates correlations when the dependent variable is binary. In this case, both of the variables are dichotomous variables. The independent variable is coded 1 when there is a holiday and 0 otherwise. Similarly, the dependent variable is coded 1 if there is an attack on that day and 0 otherwise. In addition to using multivariate logit regression, several other descriptive statistical tests such as a chi squared test will help determine whether the holidays are significantly more likely to experience terrorist attacks than other days.

Analysis of Results

Before running the statistical tests, seven religious holidays (Purim, Simchat Torah, Yom Kippur, Hannukah, Rosh Hashanah, Passover, Sukkot) and Independence Day were coded as dummy variables. That is to say that if the day was any one of those religious holidays, it was coded as 1 and if not, it was coded as 0 for each variable. After coding the holidays in an Excel file, the file was converted into a Stata dataset and merged with the "Religious Holidays" file from the University of Maryland Global Terrorism dataset. As already stated, control variables include the construction of the Israeli West Bank Barrier, the First and Second Intifadas, the First and Second wars with Lebanon, unemployment as a percentage of the labor force, and GDP per capita in constant US$. Below is a table of descriptive statistics for each variable included in the data set.

Table 1: Summary Statistics of Independent and Dependent Variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Attack	13879	.1377621	.3446625	0	1
Purim	13879	.0027379	.0522556	0	1
Simchat Torah	13879	.0027379	.0522556	0	1
Yom Kippur	13879	.0027379	.0522556	0	1
Hannukah	13879	.0218315	.1461385	0	1
Rosh Hashana	13879	.0053318	.0728269	0	1
Passover	13879	.0181569	.1335235	0	1
Sukkot	13879	.0191656	.1371119	0	1
Independence Day	13879	.0027379	.0522556	0	1
Religious Holidays	13879	.0726277	.2595338	0	1
Wall	13879	.1185244	.3232397	0	1
Attacklag	13878	.137772	.344673	0	1

Second Intifada	13879	.1274588	.3334982	0	1
First Intifada	13879	.1508754	.3579403	0	1
Yom Kippur War	13879	.001441	.0379349	0	1
First Lebanon War	13879	.0063405	.0793774	0	1
Second Lebanon War	13879	.0024497	.049436	0	1
GDP per capita	13879	944.8405	212.6408	540.9681	1453.627
Unemployment	13879	6.88706	10.60428	0	31

The statistical analysis began broadly by testing for the correlation between terrorist attacks (dependent variable) and religious holidays (independent variable) in general, choosing not to focus on one singular religious holiday. Instead, the tests evaluated whether in general, religious holidays as a singular variable (relighol) correlated strongly with an increase or decrease in terrorist attacks. However, the results demonstrated that as a singular variable, religious holidays had a very weak negative correlation with terrorist attacks in Israel. Furthermore, the P-value, which was much greater than 0.05, reinforces the weak findings and indicates that we must fail to reject the null hypothesis that there is no relationship between certain Jewish religious holidays and terrorist attacks in Israel.

Table 2: Logit Regression Model Testing the Relationship Between Religious Holidays as a whole (relighol) and Terrorist attacks

Variable	Coefficient	Standard Error	Z-value	P>[z] (P-value)
Religious Holidays	-.0757101	.0999362	-0.76	0.449
Wall	.1501239	.0911169	1.65	0.099
Attacklag	1.047354	.0591872	17.70	0.000

Second Intifada	.6743364	.1019317	6.62	0.000
First Intifada	.9606868	.0662663	14.50	0.000
First Lebanon War	-.7321898	.514887	-1.42	0.155
Second Lebanon War	.6888399	.4229292	1.63	0.103
GDP per capita	.0011263	.0001602	7.03	0.000
Unemployment	-.0056582	.0047409	-1.19	0.233
Constant	-3.386536	.1494147	-22.67	0.000

Legend
Number of Observations=13,858
Pseudo r-squared=0.0658
P-values are reported for a two-tailed significance test
Stata dropped Yom Kippur War variable from the model

However, this test cannot conclusively rule out that one or several religious holidays are correlated with a greater chance of terrorist attacks—it only establishes that overall, religious holidays are not correlated with a greater chance of terrorist attacks. By testing the individual religious holidays, we gain a sense of which religious holidays may impact the timing of terrorist attacks. We find that none of the religious holidays are very significant in regards to the strength of a correlation with terrorist attacks except for Passover, which as shown below has a coefficient of .31.

Table 3: Logit Regression Model Testing the Relationship Between the Individual Religious Holidays and Terrorist Attacks

Variable	Coefficient	Standard Error	Z-value	P>{z} (P-value)
Purim	.1594372	.4375883	0.36	0.716
Simchat Torah	-1.178558	.7443351	-1.58	0.113
Yom Kippur	-.9200624	.7338613	-1.25	0.210
Hannukah	-.125439	.180822	-0.69	0.488

Rosh Hashana	-.5279552	.4352628	-1.21	0.225
Passover	.3100984	.1687173	1.84	0.066
Sukkot	-.2190119	.2026511	-1.08	0.280
Independence Day	.1255906	.4609599	0.27	0.785
Wall	.1550975	.0911686	1.70	0.089
Attacklag	1.044763	.0592186	17.64	0.000
Second Intifada	.6784186	.1020682	6.65	0.000
First Intifada	.9609211	.0662772	14.50	0.000
Lebanon war_1	-.7322016	.5148801	-1.42	0.155
Lebanon war_2	.689646	.4229125	1.63	0.103
GDP per capita	.0011317	.0001603	7.06	0.000
Unemployment	-.0059235	.0047463	-1.25	0.212
Constant	-3.390872	.1495289	-22.68	0.000

Legend
Number of Observations= 13,858
Pseudo r-squared=0.069
P-values are reported for a two-tailed significance test
Stata dropped Yom Kippur War variable from the model

The p-value for the relationship between attacks and Passover is 0.066 for a two-tailed significance test. However, since Stata is testing a directional hypothesis, the use of a one-tailed significance test is justified, which makes the p-value .033. Compared to the other holidays, Passover seems to have an effect on the timing of terrorist attacks. For example, from 1970-2007, there were a total of 132 attacks during the selected seven major religious holidays (see Table 10). Out of those 132 attacks, 47 of those attacks, or approximately 36%, were during a Passover holiday. Furthermore, from 1970-2007, the Passover holiday totaled 252 days.

Table 4: Chi-Squared Testing of Passover and Terrorist Attacks

	Passover	Passover	Total
# of Attacks	0	1	
0	11,762 (86%)	205 (81%)	11,967 (86%)
1	1,865 (14%)	47 (19%)	1,912 (14%)

Total	13,627	252	13,879

Legend
Pearson chi2(1)= 5.1342
Pr= 0.023

As aforementioned, there were 47 dates during Passover in total on which there were attacks. Thus, the percentage of Passover days during which there was an attack is 19%, a relatively high number. Not only do these statistics indicate that Passover has the largest effect on the timing of terrorist attacks out of all the seven religious holidays included in the analysis, but also that Passover has quite a large effect on the timing of terrorist attacks in general. The p-value from the chi-squared test, which is 0.023, reinforces this conclusion that Passover has a statistically significant effect on the timing of terrorist attacks. While some may argue that Passover's significance could be related to the length of the holiday, several of the holidays tested include multiple days of observance. In addition to Passover, Hannukah, Rosh Hashanah, and Sukkot all include multiple days of religious observance. Most importantly, an "attacklag" variable was created that controls for a previous day's events affecting the next day. Conclusively, the duration of the variable should not impact its effect on terrorist attacks.

In order to establish whether there is a causal relationship between Passover and terrorist attacks, we must find some sort of causal mechanism by which the circumstances surrounding Passover create an effective atmosphere for terrorist to successfully attack and achieve their goals. For Palestinian terrorists, their main goals are twofold: 1) to maximize fear among Israeli citizens and 2) to maximize the

number of casualties resulting from the attack. There are several factors of Passover that distinguish it from the other major religious holidays included in the testing. First, Passover is the most popular and commonly observed Jewish holiday (National Jewish Population Survey (1990)). In fact, both observant and non-observant Jews celebrate Passover, making it not only a religious holiday, but also a holiday significant for Israeli culture. Consequently, many Israelis take holiday for Passover and travel to be with their families. In the Israeli school system, school children receive a whole week off for Passover and it serves as the equivalent of spring break in the American school system (Cohen and Moore). Many Israelis travel not only to be with their family, but also to relax and sightsee. Indeed, the most popular destination during Passover is Eliat, the southernmost city of Israel, which serves as a resort holiday (Cohen and Moore). Additionally, nearly 80,000 international tourists arrive each year to holiday in Israel during Passover (The Israel Project). As a result, terrorists may choose to strike during Passover because it brings together large groups of people in one centralized location. For example, the Passover Seder, which is the highlight of the Passover observance, takes place on the first two nights of the multi-day holiday. Usually, extended families come together for the Seder. Thus, from a numbers perspective, terrorists would be able to use fewer resources to kill more people because by attacking one location, it can result in multiple fatalities. For example, on March 27th, 2002 Hamas attacked the Park Hotel in Netanya, Israel during a Passover Seder. The suicide bombing, which soon became to be known as the Passover Massacre or the Park Hotel Passover attack was the single deadliest uprising since the start of the Second Intifada (BBC

News 2003). It is important to note that nearly 250 people were gathered for the large Seder dinner and as a result the bomb resulted in a large amount of damage (there were 21 fatalities and 170 people injured). Furthermore, it is integral to note that the attack was carried out in an indoor setting, where Passover Seder is usually held. Instead of attacking an outdoor market or any other outdoor location, the terrorist's strategy to detonate the bomb indoors resulted in more damage and fatalities. For example, a CNN reporter who was present at the Passover Seder reported, "It wasn't a huge amount of explosives used, but the reason there was so much damage is because it was contained, because it was inside. The blast really had nowhere to go. It blew out the windows, but it was contained inside that banquet room. So that is the reason why there has been so much damage and so much loss of life and so many people wounded" (Vause and Costello, CNN). As mentioned earlier, Palestinian terrorist organizations follow the attrition strategy and have limited resources to execute their attacks. Thus, it is critical that they pick locations and dates that result in the highest rate of success. The unique circumstances produced by Passover seem to be conducive to successful attacks.

In response to the attack during the following Passover, Israel announced that all Palestinians from the West Bank and the Gaza strip would be blocked from entering Israel (BBC World News 2003). The drastic move came as a response to ensure that an attack on the anniversary of the Park Hotel Passover attack would be unlikely. As a result of this attack and other attacks that my have occurred during religious holidays, the Israeli government raises security forces throughout the country. Palestinian terrorist organizations did not attack again during Passover

until 2006. For example, in 2006 during Passover, Israeli Defense Forces (IDF) thwarted two attackers that were either trying to attack the IDF troops themselves or execute an attack in one of the communities (Greenberg 2006). Additionally, the IDF cited that terrorist groups could be seeking to launch rockets at the communities or carrying out a shooting attack (Greenberg 2006). Although these attacks were unsuccessful due to bolstered security forces, a suicide bombing in a restaurant during Passover in 2006 was successful, proving that large threats exist during particular religious holidays.

We have discussed how Passover creates unique logistics that are favorable for a successful terrorist attack. In addition to this logistical element, there is a psychological factor that contributes to the variable "Passover" statistical significance in the testing. Passover is also celebrated as the Festival of Freedom and commemorates the celebration and role of freedom as a basic human right. By attacking on this particular holiday, Palestinian terrorist groups such as Hamas are not only attacking Israeli citizens, but also the very freedom of existence of the state of Israel. Since Passover celebrates the Israelites' exodus from Egypt to the modern-day Israel and Occupied Palestinian Territories, an attack on the day is meant to inflict psychological damage to the Israeli citizens. By attacking on the day that commemorates freedom for the Jewish people, the terrorist groups are maximizing one of their goals—to instill and perpetuate fear among ordinary citizens. The psychological impact of attacking on a religious holiday is heightened during Passover due to its history connected to both freedom and larger questions in the Israeli-Palestinian conflict. Finally, the attack also highlights the quest for

Palestinian freedom. For example, after the attack, a Hamas spokesman responded, “This is a trial (attempt) to send a letter, to send a message, to all the world that we are trying to fight for our own freedom against a terrorist government in Israel led by Sharon" (CNN 2002).

One of the most important factors associated with Passover is the large amount of travel and tourism during the holiday, which can explain the increased likelihood of an attack during Passover. Since Passover coincides with the spring tourism season and people take weeklong vacations for the holiday and travel within Israel, there is an increase in the amount of large crowds in outdoor spaces. Attacks are more likely to be prevalent during the spring months because more people are out and about, facilitating the ease with which terrorist organizations can strike targets. Furthermore, most people usually travel during the holiday season. For example, in Israel, tourism spikes during April and October, months during which both Passover and Yom Kippur, two of the most celebrated holidays, occur (Ministry of Tourism 2010). From a theoretical standpoint, tourism is directly related to the holidays. A distribution of attacks by month demonstrates that terrorist attacks take place during every single month, but that they are concentrated in the spring months, particularly around the time of Passover.

Table 5: Distribution of Attacks by Month (Cumulative from 1970-2007)

Month Attack	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
0	1003	905	1001	957	1014	985	1032	994	1010	1042	968	1056
1	175	168	177	183	164	155	146	184	130	136	172	122

March and April are the two consecutive months during which the greatest number of attacks takes place. In addition, April, the month during which Passover occurs has the greatest percentage of attacks—there is an attack 19% of the time during April from 1970-2007. It is noteworthy that the spring season has the highest rate of tourism, averaging about 260,500 tourists each month. In comparison, the summer months average 228,500 tourists each month (CBS Israel). Since Passover actually causes an increases in tourism, one of the reasons terrorists choose to strike during Passover is it will dramatically impact the Israeli economy, which relies heavily on tourism, particularly tourism for religious reasons or during religious holidays (Ministry of Tourism 2010). As a result of Israel depending heavily on tourism as a source of foreign earnings, the country's economy suffers from a decline in tourism due to terrorism (Aly and Strazicich 2000, 3). Therefore, terrorist organizations know that timing their attacks during Passover, which results in the height of the spring tourism season, will affect Israel's overall economy, influencing not only the economic health of the country, but also impacting Israeli citizens psychologically that terrorist groups can affect their country's economy. In this light, terrorist groups can also use the attrition method in an economic fashion—that is to say that the larger the economic costs that the Palestinian terror groups inflict on the Israeli economy, the larger the impact on the Israeli people to show that these groups have the capacity to incur similar economic destruction in the future. The strategy of attrition involves maximizing the damage, in this case the economic damage. As a result, Palestinian terrorist groups will choose to time their terrorist attacks during

the Passover holiday because the maximum economic damage in terms of tourism will be done during this time as compared to any other period of time or season. Hotels, restaurants, malls, and individual citizens lose tremendous amounts of capital if tourists decide to cancel their plans due to terrorist activity (Aly and Strazicich 2000). Terrorist activities and successful attacks demonstrate to tourists, particularly international tourists, that Israel is not a safe country and that the government cannot protect its citizens or the tourists in the country. The undermining of the Israeli government in both the eyes of its citizens and international tourists satisfies the terrorists' strategy to intensify the pressure on the Israeli government to give in to the demands of the terrorist group.

Upon first glance, it seems as if the terrorists were motivated to attack at the Park Hotel during Passover 2002 solely because of the religious holiday. It would seem to confirm my hypothesis that religious holidays, in this case Passover, are a factor in the timing of terrorist attacks. However, upon deeper investigation, there could be other factors that also contribute to the timing of the attack. During the same time as Passover in 2002, the Saudi Arabian government planned to host a peace initiative at the Beirut Summit where Arab leaders would gather to discuss a new peace plan for the region. Hamas rejected this plan and one Hamas spokesperson stated, "The bombing tonight came as a reaction to what is happening in Beirut. We want to remind the Arabs and the Muslims what resisting the occupation means" (Brinkley 2002). Thus, the timing of the attack is directly linked to the impending peace talks, which Hamas wanted to derail. In this light, it is doubtful that Hamas executed the attack solely because of the religious holiday.

While the decision to attack at the particular location at the Park Hotel during the Passover Seder did result in maximizing fatalities and fear, the timing of the attack was motivated in party by the upcoming peace talks. While there is evidence that the Passover Seder and the Peace Talks motivated the attack (and thus are not mutually exclusive), it is clear that the Passover holiday was not the sole factor in the timing of the terrorist attack.

Although the logit regression model produces results that show that Passover is statistically significant, it is difficult to discern the magnitude of the effect, especially since the anecdotal evidence regarding the 2002 Passover attack points to impending peace talks as the primary factor in the timing of terrorist attacks rather than the holiday. In order to assess the substantive effect of Passover on the timing of terrorist attacks, a statistical program in Stata named "Clarify" can be employed to interpret the statistical significance of the previous logit model. In this particular case, Clarify predicts the percent chance of an attack on a day when there is no Passover holiday (Passover=0) and on a day when there is a Passover holiday (Passover=1) when GDP per capita and unemployment are set at their mean values and the dummy variables are set to either 0 or 1. The results of the test of the magnitude of the effect of Passover on terrorist attacks are shown below.

Table 6: Magnitude of the Effect of Passover on the Timing of Terrorist Attacks When Passover=0 and all dummy variables=0

Quantity of Interest	Mean	Standard Error
Pr(attack=1)	.0860959	.0030858

Legend
Stata Model: setx Passover=0
simqi, prval(1)

Thus, when all the other variables are set to certain values and there is a day without a Passover religious holiday, there is an approximately 9% chance of a terrorist attack in Israel. However, when all the variables are set to the same certain values and there is a day with a Passover holiday, there is approximately an 11.5% chance of a terrorist attack (see results below). In conclusion, Passover increases the chance of an attack approximately 3%, which is quite significant.

Table 7: Magnitude of the Effect of Passover on the Timing of Terrorist Attacks when Passover=1 and when dummy variables=0

Quantity of Interest	Mean	Standard Error
Pr(attack=1)	.1151592	.0178438

Legend
Stata Model: setx Passover=1
simqi, prval(1)

Additionally, the chance of an attack increases dramatically during a day of Passover when some of the dummy variables are set to 1. For example, we held the other religious holidays at 0 since they do not overlap with Passover. Then, the wall and and the Second Intifada variable were set to 1 and Clarify tested for the chance of an attack without a Passover day and with a Passover day.

Table 8: Magnitude of the Effect of Passover on the Timing of Terrorist Attacks when Passover=0 and when wall=1, and Intifada 2=1

Quantity of Interest	Mean	Standard Error
Pr(attack=1)	.1787263	.0186756

Legend
Stata Model: setx Passover=0
setx all other dummy variables=0
simqi prval (1)

Table 9: Magnitude of the Effect of Passover on the Timing of Terrorist Attacks when Passover=1, and when wall=1, and Intifada 2=1

Quantity of Interest	Mean	Standard Error
Pr(attack=1)	.2293497	.0372102

Legend
Stata Model: setx Passover=1
setx all other dummy variables=0
simqi prval (1)

In this model, a chance of an attack when Passover is set to 0, the wall is in existence and when the Second Intifada is occurring is 18%, which is relatively high compared to the first model. When we change Passover to 1, the chance of an attack dramatically increases to 23%. Accordingly, in this model, the chance of an attack increases 5% when Passover occurs.

Statistically and substantively, Passover has an important effect on the timing of terrorist attacks. Passover is unique among the other religious holidays in terms of having an effect on the timing of terrorist attacks. The causal linkage

between Passover and the timing of terrorist attacks, as discussed earlier in this section, is threefold. First, Passover yields logistical advantages such as greater numbers of people in centralized locations that maximizes the success of one of the terrorists' intermediate goals—loss of lives. Second, psychologically, Passover leads to heightened emotional states. By attacking on the holiday that celebrates freedom for the Jewish people, the terrorists are maximizing another one of their intermediate goals, inducing psychological fear among the Israeli citizens. Finally, since Passover causes a spike in tourism, attacking on the holiday results in severe economic damage, maximizing the terrorists' intermediate goal to hurt the Israeli economy. All of these intermediate goals lead to the ultimate goal of the terrorist organizations, which is a change of Israeli policy towards the Palestinian people.

The Cat and Mouse Game Between Terrorist Organization and State Governments

Out of the total number of days in the dataset (13,879 days from 1970-2007), an attack occurred during the one of the seven major religious holidays about 1% of the time while the percentage of days, which are holidays, is 7% (see table below).

Table 10: Chi-squared testing of Religious Holidays as a whole and Terrorist Attacks

	Religious Holidays	Religious Holidays	Total
# of Attacks	0	1	
0	11,091	876	11,961
1	1,780	132	1,912
Total	12,871	1,008	13,879

Legend
Pearson chi2(1)= 0.4243
Pr= 0.515

In the whole dataset, there were 1,912 days during which an attack occurred out of 13,879 possible days in the dataset. In other words, there was a terrorist attack in Israel approximately 14% of the time from 1970-2007. While the number of attacks during Passover is relatively low compared to the total number of days in the dataset, it is important to note that out of the total number of Passover days in the dataset, 19% of the days involved an attack (see Table 4). Therefore, considering that the baseline frequency of an attack was 14%, the rate during Passover increases significantly. However, the predominant reason why terrorist groups do not attack 100% of the time during Passover even though the circumstances are beneficial to their success is the cycle of the cat and mouse game between terrorists and the target government. Essentially, the terrorist strikes using a particular method, weapon, or timing strategy and then the government institutes new measures to block that strategy. In turn, the terrorist organization continuously brainstorms new strategies in order to surprise the government and execute a successful attack (Gjelten and Temple-Raston 2010). Thus, Palestinian terrorist organizations have to think of creative ways to strike in terms of timing besides attacking on religious holidays, which accounts for the fact that terrorists do not consistently attack during Passover. For example, the largest Passover attack was the Park Hotel bombing in 2002. Following this attack, Palestinian terrorist

organizations did not execute a major attack during Passover until 2006, when a suicide bomber successfully executed an attack in a Tel Aviv shwarama restaurant during the crowded lunch hour and Passover holiday. However, when several terrorist organizations tried to execute a multitude of Passover attacks in 2007, they were unsuccessful due to increased surveillance and intelligence during the holiday (Kerschner 2007). Similarly, the year following the 2002 Passover attacks, BBC news reported that, "Hundreds of police and volunteers are stepping up security in Israel during the week-long Passover holiday… Israeli security forces also set up roadblocks on Tuesday night around Jerusalem, after receiving warnings of imminent attacks, Israeli Army Radio said." (BBC News 2003).

Impending Peace Talks as a Factor in the Timing of Terrorist Attacks

An additional factor in the terrorist choice to attack during a certain time is an unquantifiable variable- impending peace talks. Terrorist groups choose to attack during a certain time to disrupt upcoming peace talks designed to further derail relations between the Palestinian Authority and the Israeli state. For example, in 2008, Hamas, the Islamic organization that controls the Gaza Strip, carried out an attack in Israel right before the weeklong Passover holiday in order to disrupt a meeting between former President Jimmy Carter and exiled leaders of Hamas in Syria (Kershner 2008). The goal of the talks was to mediate a ceasefire between Hamas and Israel and to work out a prisoner exchange between the two (Kershner 2008). Hamas is not interested in negotiations because they believe firmly in the eradication of the state of Israel. Thus, according to Hamas, any sort of negotiation with the Israeli government is a sign that they have the right to exist as a state,

which they do not believe in. Similarly, on August 31st, 2010 Hamas terrorists ambushed a car filled with Israeli citizens, including a pregnant woman, and murdered them as they were travelling through the West Bank. The terrorist attack coincided with the resumption of the Israeli-Palestinian peace talks in Washington, D.C. (Anti- Defamation League 2004). In fact, the Palestinian Authority issued a warning in September of 2010 to Israel that a terror spree would continue as the negotiations between Israel and the Palestinian Authority progressed (Waked 2010).

Why is it important for Hamas to plan the timing of their terrorist attacks either right before or during the Israeli- Palestinian peace talks? Scholars Kydd and Walter establish that, "Hamas's attacks against Israel have not been random. From 1993 to 2001, Hamas concentrated its violence around six major events: (1) the September 1993 signing of the Oslo I peace accord, (2) the May 1994 signing of the Cairo agreement, (3) the October 1994 signing of a peace treaty between Israel and Jordan, (4) the 1996 Palestinian and Israeli elections, (5) the October 1998 signing of the Wye agreement, and (6) the February 2001 Israeli elections." (Kydd and Walter 2002, 280). Since 2002, Hamas has continued this into its overall strategy—most notably, they have resumed intense attacks in late 2010 to disrupt peace talks. The predominant reason they follow this strategy is to provoke Israel into 1) suspending involvement in the peace talks, and 2) acting violently or prejudicially against Palestinians in the Occupied Territories (Kydd and Walter 2002). The objective is to ensure that Israel alienates the Palestinian people and that the Palestinian population becomes so enraged as to denounce any sort of negotiation

with Israel. Secondly, this strategy also radicalizes the population who either support Hamas and other militant organizations politically or who may go so far as to join the organization as terrorists or fighters. Since Hamas advocates for an Islamic state to be established in present day Israel and the Palestinian Occupied Territories, any sort of negotiation of a two state solution is viewed as a loss for the people of Palestine (although certain factions in Hamas have begun to accept a possible two state solution with very strict demands regarding Palestinian land entitlements). By doing this, Hamas' strategy not only involves attrition, but also provocation to gain the support of the Palestinian people and spoiling (a strategy that involves disrupting the peace between moderate leaders). In summation, Hamas' timing of terrorist attacks during impending peace talks is a logical choice that plays into their overall strategy against a two state solution.

Although impending peace talks affect the timing of terrorist attacks, especially during the 2008 Passover attacks in Israel, it does not exclude or negate Passover as a factor in the timing of terrorist attacks. Often, several factors, not just one single factor, compound to create the most optimal timing, location, or choice of target. For example, after the 2002 Park Hotel Passover attack, the deputy spokesman for Israel's Foreign Ministry in 2002, Emmanuel Nahshon explained, "Its not a coincidence that the idea was to hit during Passover Seder, one of the most important moments in Jewish life, and it was meant to take place during the Beirut summit. So it sends a double message to Israel and the Jews of hate, and to the Arabs, a message of extremism." (Brinkley 2002). In summation, both Passover and the impending peace talks were factors in the timing of terrorist attacks in the 2002

bombing because the terrorists believed that attacking on that particular date would both yield a message of hatred of the state of Israel and the Jewish faith and also incite Palestinians to join their cause. The terrorist group maximized the success for both goals by choosing to strike during Passover and right before the Beirut Summit attacks, a move it knew was likely to contribute to the attrition strategy (demonstrate its hatred of the state of Israel and the Jewish faith) and the provocation/ spoiling strategy (provoke the Israeli government to strike against Palestinian thereby inciting Palestinians citizens to join their cause and to disrupt any progress of peace talks of a two state solution).

The Role of Randomness in the Timing of Terrorist Attacks

We have found that although we cannot fail to reject the null hypothesis that religious holidays as a whole are not significant factors in the timing of terrorist attacks, there is statistical and substantive evidence that Passover is a significant factor in the timing of terrorist attacks. While Passover did seem to affect the timing of terrorist attacks, not all of the variation in timing can be attributed to Passover solely. Some of the variation in timing can be explained by the timing of other significant events, such as the Beirut Summit peace talks during the 2002 Park Hotel Passover attack. The theory behind religious holidays (relighol) as a factor in the timing of terrorist attacks invoked the notion that terrorist groups act rationally. Religious holidays create unique circumstances such as large gatherings of people in centralized locations that in theory would seem to benefit the perpetrator of the attack since they can maximize the damage from the attack with limited resources. Furthermore, ideologically, the effect of striking during a Jewish religious holidays is

strong on an average Israeli citizen's psyche. However, there are two factors that may account for the lack of causation between religious holidays as a whole and the timing of terrorist attacks. First, security tends to be tighter during religious holidays because Israeli defense forces realize that these unique circumstances create a perfect scenario for terrorists to strike. This notion of "reactivity" plays into the decision making process of Palestinian terrorist organizations whether they will be able to execute their attack. It is important to reinforce the idea that since Palestinian terrorist groups employ attrition, any sign of failure is a huge detriment to their strategy. Instead, a failure often strengthens group identity of the target group and bolsters citizens' trust and perception of capability of the target government. Additionally, the Israeli government tends to close off certain parts of the Occupied Palestinian Territories during religious holidays. Although this is not exclusive to major religious holidays, it creates a crucial obstacle to a successful attack within Israel. Earlier in March 2010, the Israeli Defense Forces blocked off the West Bank for the Passover holiday, citing that, "The measure was enacted "following situation assessments adopted by the defense establishment," (WIBW.com).

The second factor that accounts for religious holidays as a whole not being a major factor in the timing of terrorist attacks is that attacking consistently on religious holidays would be contrary to the terrorist strategy of attacking randomly, or rather unpredictably. Random may carry the connotation that attacks are carried out haphazardly. However, random in this sense equates with unpredictability. Attacks are well thought out, financed, and involve strategy, but the target location,

timing, or choice of target may be unpredictable. Why? Sandler and Enders claim, "Such actions make attacks appear to be random, so that a targeted society must expend large amounts of resources to protect a wide range of vulnerabilities. This simulated randomness provides terrorists with a cost advantage over the stronger authorities who must defend against the threat that they pose (Hirshleifer, 1991). Because people tend to over-respond to unlikely catastrophic events while ignoring more likely daily dangers (e.g., dying in a car accident), terrorists succeed in achieving society-wide anxiety with a minimal amount of resources." (Sandler and Enders 2002, 2). Attacking consistently on religious holidays creates less fear and less chance of maximum damage. If citizens know that there is a strong chance of being *consistently* attacked on religious holidays, they will take precautions and the government will improve and intensify its security. Even if an attack is successful, terrorist groups will not achieve maximum fear because attacks are more terrifying when they are unexpected and especially when people are in a relaxed, comfortable setting. In this light, since Passover is nearly a weeklong holiday, terrorist organizations can still achieve this level of unpredictability in the timing of the attack. Therefore, attacking on Passover is not necessarily antithetical to the strategy of attacking randomly because there is a week long period during which terrorist can strike. Consequently, a pattern of religious holidays as a factor in the timing of terrorist attacks is limited because of the elements of both strong security and the role of unpredictability in the timing of terrorist attacks.

Conclusion and Opportunities for Future Research and Development

The original hypothesis that religious holidays are a factor in the timing of terrorist attacks has little statistical support. While there is no causation between the seven religious holidays as a whole and terrorist attacks, there is a conclusive causal linkage between Passover and the timing of terrorist attacks. Terrorists are more likely to strike during Passover because Passover yields certain circumstances that make it more likely than any other holiday or any other day to execute a successful terrorist attack. However, not every single attack planned during Passover is caused exclusively by the religious holiday itself-- the timing of the attack may be linked to external factors such as an intention to derail planned peace talks (such as the 2002 Passover attack at the Park Hotel).

Passover is not only statistically significant, but it is also substantively significant. Logistically, Passover produces large crowds who gather to worship and conduct the Passover Seder. Thus, the centralization of the target group is important for terrorists' success because they can use fewer resources (bombs, capital, etc.) to make a greater impact in terms of casualties and the number of injured people. Emotionally, attacking on Passover gives terrorists the advantage of imparting a heightened sense of stress and fear for the Israeli public. This in turns fulfills the Palestinian terrorist organizations' goal of attrition. Finally, we can isolate a causal linkage between the height of the spring tourism season that occurs during Passover and the timing of terrorist attacks: domestic and international tourism numbers within Israel increase a great amount during Passover. Therefore, terrorist groups are affecting Israeli citizens both in terms of their safety and their economic health. If tourism, particularly international tourism declines due to terror threats and

attacks, the Israeli economy can plummet. This consideration combined with the fact that terrorist groups can still attack randomly or unpredictably within the weeklong Passover holiday supports the notion that it is a prime time to strike.

Although Passover is a significant factor in the timing of terrorist attacks, there is evidence that other factors compounded with Passover led to the timing of terrorist attacks in Israel. One other explanation for the timing of terrorist attacks is that they tend to coincide with upcoming peace talks or negotiation summits. Hamas has a propensity to attack intensively and frequently during the days prior to a major impending talk or during the talks themselves. Although this was not quantitatively or statistically studied, news articles, Israeli and Palestinian security statements, and other anecdotal evidence help support the claim that upcoming peace talks are a factor in the timing of terrorist attacks in Israel.

The findings from this research have far-reaching implications. Although any single month or season or holiday cannot be dismissed as a "safe" or "attack prone" time, there are certain times of the year when security should be reinforced. The Israeli government is generally on high security, especially since unpredictability is a strategy of terrorist groups. The research findings paint a nuanced picture of the risk that religious holidays pose as a significant factor in the timing of terrorist attacks. On the whole, religious holidays are not more prone to terrorist attacks than any other days. However, Passover presents an interesting case due to its statistical significance and substantive significance. As evidenced by the 2002 Park Hotel Passover attack, it is clear that often times, several factors combine to create an optimal time for terrorist to strike. Nonetheless, for a few of the largest attacks

during Passover, it is difficult to discern which factor, Passover or impending peace talks or even happenstance, carried more weight in the terrorist groups' decision making process to attack on that particular date. In summation, to further explore the degree of impact of Passover on the timing of terrorist attacks, more qualitative research on attacks that occurred during Passover must be done. One such example of further helpful research is a case study approach by which a researcher can investigate all the attacks that occurred during Passover and examine the motivations of the terrorist groups. This will allow us to draw more concrete conclusions regarding the qualitative magnitude of the effect of Passover as a factor in the strategic planning of terrorist attacks.

Appendices

Appendix A: Leaving out the Four Seasons

During testing, four seasonal variables were created: spring, summer, winter, and autumn. However, due to collinearity, the computer program does not have enough information to be able to separate out the spring from the Passover effect. In order to establish whether adding the seasonal variables significantly increases the log-likelihood (in which case it is justified to include them), a likelihood ratio test was conducted through Stata. See below the results:

lrtest m1 m2

Likelihood-ratio test (Assumption:m1 nested in m2)	LR chi2(3)= 1.73
	Prob>chi2=0.6293

The variable "m1" stands for the logit regression result estimates from the model with all of the variables included except the seasonal variables. The variable "m2" stands for the logit regression result estimates from the model with all of the variables plus the seasonal variables. The result is that the p-value is 0.6293, indicating that adding seasonal variables does not significantly increase the log-likelihood and thus can be removed from the model. In essence, the simpler model was used in my paper.

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