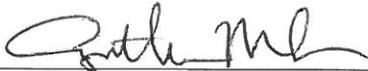


IS THERE A RELATIONSHIP BETWEEN CHARACTERISTICS OF LOCATIONS
OF TERRORISM EVENTS AND THE NUMBER OF FATALITIES THAT RESULT?

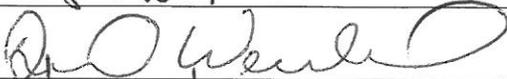
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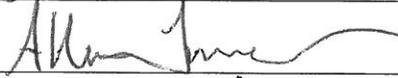
Lauren E. Mansfield
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Submitted to the
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George Mason University
in Partial Fulfillment of
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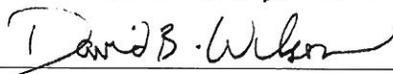
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Is There a Relationship Between Characteristics of the Locations of Terrorism Events and
the Number of Fatalities that Result?

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Arts at George Mason University

By

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Fall Semester 2012
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Dedication

This is dedicated to my parents, Lynette and Richard, for supporting me throughout my many years of education and to my dog, Oscar, for always making sure I finished my homework.

Acknowledgements

I would like to thank my relatives, friends and supporters who have made this thesis possible. I would like to give a special thank you to Drs. Lum, Turner, and Weisburd for their constant advice and guidance while completing this research.

Table of Contents

	Page
LIST OF TABLES.....	VI
LIST OF FIGURES.....	VII
ABSTRACT.....	VIII
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: LITERATURE REVIEW.....	7
ENVIRONMENTAL CRIMINOLOGY, ROUTINE ACTIVITIES THEORY, AND OPPORTUNITY THEORY AND THEIR RELEVANCE TO TERRORISM.....	8
THE LINK BETWEEN LOCATION AND TERRORISM.....	16
QUESTIONS AND HYPOTHESES.....	20
DATA SOURCE, UNITS OF ANALYSIS AND SAMPLE.....	24
DEPENDENT AND INDEPENDENT VARIABLES.....	34
<i>Dependent Variable.....</i>	<i>36</i>
<i>Independent Variables- Location-based.....</i>	<i>37</i>
<i>Independent Variables- Non-Location Based.....</i>	<i>40</i>
METHOD OF ANALYSIS.....	43
LIMITATIONS.....	43
CHAPTER 4: RESULTS.....	46
DESCRIPTIVE STATISTICS OF THE VARIABLES.....	46
<i>Location-Based Variables.....</i>	<i>47</i>
<i>Non-Location Based Variables.....</i>	<i>50</i>
CROSS TABULATIONS OF THE LOCATION-BASED VARIABLES AND THE NUMBER OF FATALITIES.....	51
CROSS TABULATIONS FOR NON-LOCATION BASED VARIABLES AND THE NUMBER OF FATALITIES.....	57
CHAPTER 5: DISCUSSION.....	60
LIMITATIONS OF THE FINDINGS.....	68
FURTHER RESEARCH.....	70
POLICY IMPLICATIONS.....	72
CHAPTER 6: CONCLUSION.....	73
REFERENCES.....	74

List of Tables

Table	Page
1. Final Terrorism Event Sample from the Global Terrorism Database.....	29
2. Number of Terrorist Attacks per Country between 1990-2010.....	30
3. Most Frequently Targeted Cities between 1990- 2010.....	30
4. Terrorist Events Included in the Study	31
5. Terrorist Organizations Responsible for Attacks between 1990-2010	34
6. The Dependent and Independent Variables	42
7. Descriptive Statistics of Location-Based Variables.....	47
8. Descriptive Statistics of Non-Location Based Variables.....	50
9. Cross Tabulations for Location Type and Fatalities.....	52
10. Cross Tabulations of Human Guardianship and Fatalities	53
11. Cross Tabulations of Technology Guardianship and Fatalities	54
12. Cross Tabulations of Access and Fatalities	54
13. Cross Tabulations for Population Density and Fatalities.....	55
14. Cross Tabulations for History of the Location and Fatalities	56
15. Cross Tabulations for Unusual Activities and Fatalities.....	56
16. Cross Tabulations for Time and Fatalities	57
17. Cross Tabulations for Weapon Type and Fatalities.....	58
18. Cross Tabulations for Motives Against Fatalities.....	58
19. Cross Tabulations for Method of Attack of the Organization Against Fatalities	59

List of Figures

Figure	Page
1. Number of Fatalities per County between 1990-2010.....	30
2. Distribution of the Number of Fatalities per Terrorist Attack.....	36, 45

Abstract

IS THERE A RELATIONSHIP BETWEEN CHARACTERISTICS OF THE LOCATIONS OF TERRORISM EVENTS AND THE NUMBER OF FATALITIES THAT RESULT?

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This thesis analyzes the relationship between characteristics of the locations of terrorism events and the number of fatalities that result. Through the lenses of environmental criminology, routine activities theory, and opportunity theory, the characteristics of locations that suffered an attack are collected and examined against the number of fatalities in that attack using the University of Maryland's National Consortium for the Study of Terrorism and Responses to Terrorism (START) Global Terrorism Database and major news outlets. Although limited in available data, this study cautiously finds a statistically significant relationship between fatalities and certain types of guardianship in an unexpected direction, time, and method of attack of the terrorist organization. These findings question the appropriateness of applying routine activities theory and environmental criminology to the study of terrorism

Chapter 1: Introduction

This study analyzes the relationship between the number of fatalities that result from terrorism and characteristics of locations in which those events occur. The relationship between the number of fatalities and characteristics of the location targeted may provide insight into what many consider to be the most frightening aspect of terrorism. Terrorists wish to make a shocking statement with each attack and often this statement is killing the maximum number of individuals possible. The number of fatalities, therefore, may be connected to the nature of the location if terrorists choose settings that are conducive to maximum fatalities.

Terroristic tactics have evidence dating back to antiquity; modern terrorism, finds its roots beginning after World War II (Naftali, 2005). However, the general American public was not particularly aware of, or concerned about terrorism until the late 1990s and early 2000s (Senechal de la Roche, 2004) Especially after the September 11, 2001 terrorist attacks against the United States, the term “terrorism” and the prevention of terrorism has become a primary concern of both politicians and citizens alike. It is a term that has gained a time slot in many political debates and a term that has created confusion and fear (Forst, 2009).

Despite the claim by many politicians that we know how to combat terrorism, dimensions of terrorism and terrorist activities have not often been studied using rigorous

scholarly approaches and methods (Forst, Greene & Lynch, 2011, Forst, 2009; Grabosky & Stohl, 2010; Lum & Kennedy, 2011, Webb & Cutter, 2010). Senechal de la Roche (2004) argues that the terrorist attacks of September 11, 2001, and other attacks in Spain and Great Britain, caught the world off guard and the academic fields of sociology and criminology unprepared. However, the recent events of terrorism have created public awareness and curiosity about the dimensions and motivations behind terrorism (McCann, 2006). Thus, there is more attention to empirically understand terrorism and counterterrorism, especially using disciplinary perspectives in criminology, law and society, sociology, anthropology, and economics. Exploring and applying theories from these disciplines to the study of terrorism may help build further knowledge about the phenomena. This increased academic attention is reflected in increased research on the topic (Lum, Kennedy & Sherley, 2006) and the creation of major centers of research like the National Consortium for the Study of Terrorism and Responses to Terrorism (herein, “START”) at the University of Maryland.

In particular, criminologists have attempted to bridge the gap between criminological theory and terrorist events by applying existing theories and crime prevention ideas to terroristic phenomena (Forst et al., 2011 [see specifically, Lum & Koper’s chapter, pp.129-150]). As LaFree and Hendrickson (2007) argue, “criminology can play a major role in helping us understand the etiology of terrorist behavior” (p. 782). Although differences have been established between crime and terrorism with regard to motivation, level of planning and funding, and the scale and organization of attacks (Clarke & Newman, 2006, p.4), the reason for applying criminology to explaining

terrorism is because terrorism and traditional crime often has blurred lines. The consensus on the definition of terrorism is an act of violence or threat of violence, which creates fear in the victim or victims to achieve larger political goals (Grabosky & Stohl, 2010; McCann, 2006; Naftali, 2005). The general definition of crime is an act or behavior that creates a breach of rules or laws or a violation of individual rights or freedoms. Both terrorism and crime point to illegal acts of persons and property crime, and also may be connected to other criminal enterprises. For example, the 2004 Madrid, Spain train bombings were financed almost entirely with drug trafficking profits (LaFree & Hendrickson, 2007). It has also been noted many successful counterterrorism operations and arrests, like crime prevention more generally, have occurred at the community-level through police departments that operate under the traditional criminal justice approach (LaFree & Hendrickson, 2007).

Despite the connections between crime and terrorism, criminology does not provide specific theories about what terrorism is, how it operates, how to prevent it, or why individuals become terrorists (Rosenfeld, 2004). Yet, researchers argue that criminology and criminal justice studies could be used to analyze, prevent and understand terrorism (LaFree & Dugan, 2007; Lum & Koper, 2011). Not only are criminologists able to apply existing theories to a new type of “crime”, they can also apply criminal justice perspectives that may assist in the legal processing of terrorists, responding to terrorist attacks, and creating preventive measures against terrorist attacks. For example, criminologists have already offered explanations of terrorism using routine activities theory and opportunity theory (Clarke and Newman, 2006), deterrence theory (LaFree,

Dugan & Korte, 2009), rational choice theory (Dugan, LaFree, & Piquero, 2005) and social learning theory (Weisburd & Lerna, 2006). These theoretical approaches may contribute to the increased understanding of terrorism and its dimensions.

Environmental criminology theory focuses on criminal patterns within a specific environment while analyzing the external environment factors on the location, the perpetrator, and the opportunity for crime (Wortley & Mazerolle, 2008). Related to environmental criminology, routine activities theory focuses on the convergence of motivated offenders, suitable targets, and the lack of capable guardians (Felson, 2002) and how these convergences lead to attracting crime at places (Sherman, Gartin & Buerger, 1989). These theoretical approaches have been successful in explaining traditional criminal patterns and activities and may prove useful in explaining aspects of terroristic events (Clarke & Newman, 2006). For example, sociological and criminological theories of routine activities, environmental criminology, and opportunity theory all suggest how important *places* and attributes of locations (and people's routines in these locations) are to explaining why events occur at that location. Similarly, terrorism events and their characteristics may also be explained by understanding the locations where they occur.

Terrorist events may occur because of a variety of available targets, lack of guardianship in different forms, access to weapons that enable the event to occur, attributes of physical targets or determined individuals (Clarke & Newman, 2006; Grabosky & Stohl, 2010). These aspects all converge in a location or environment that may provide the opportunity for terrorist attacks to occur. Similarly, according to routine

activities, environmental criminology and opportunity theories crime occurs in places that lack guardians, attract opportunities for offending, and have access to facilitators of crime (Clarke, 1995; Felson, 2002; Sherman et al., 1989). Locations may play an important role in terrorist events just as locations play important roles in crime events.

This study aims to explore whether place-oriented criminological theories like routine activities and environmental criminology are an appropriate approach to diagnosing the selection of locations for terrorist attacks and determining the consequences of those attacks. In particular, this study is focused on one particular consequence: the number of fatalities that result in a terrorist attack and whether the nature of the location chosen is related to greater fatalities. One goal of a terrorist attack is to produce fear into the targeted population. Death is often considered to be the most frightening aspect of terrorism and locations may be chosen to produce the maximum number of fatalities. Understanding the nature of locations chosen for terrorism, therefore, may provide insight into the relationship between characteristics of targets and the consequences of terrorism (fatalities). Location characteristics may enable or prevent fatalities in an attack because certain characteristics will be more or less conducive to greater or fewer fatalities. Characteristics of places attacked also may provide clues about why terrorists are attracted to those places and also to think about preventing violence at these places.

In the next chapter, I will review existing criminological place-based theories that might be applicable to hypothesizing about the relationship between locations of terrorist attacks and the number of fatalities that result. In Chapter Three, I will describe my

method of analysis and the data used (from the University of Maryland START Center's Global Terrorism Database) to examine the relationship between location and terrorism fatalities. The results of my analysis will be presented in Chapter Four followed by a discussion of the implications of these findings to both theory and policy in Chapter Five.

Chapter 2: Literature Review

Terrorist events, like crime, do not occur in a vacuum but within a particular context. For example, many events occur in places where there is a large number of potential victims, where the media impact will be high (such as airplanes or large buildings or symbolic buildings), or where there may be a lack of guardianship, easy access and egress or access to weapons or devices that enable the attacks. Similarly, certain characteristics of locations may also help prevent terrorist events from occurring, such as places with high levels of guardianship or access barriers.

Because characteristics of locations of terrorism may matter in whether attacks are successful, environmental criminology and routine activities are two theories in criminology that may be useful in hypothesizing about the connection between characteristics of locations and terrorist attacks (Clarke and Newman, 2006). Connected with these two theories is also opportunity theory (and related to opportunity, rational choice). Though a psychological criminological theory, opportunity and rational choice theories are applicable to location-based studies. Opportunity theory would suggest that criminals or terrorists act according to a cost-benefit analysis of the situation, taking advantage of opportunities present in a location to commit crime (Clarke & Cornish, 1993).

Previous studies and literature analyzing the various aspects of environmental criminology and routine activities theory and the importance of the theories to the field of criminology may also be applied to terrorism. These findings from previous studies are valuable because they discuss the importance of both theories to the field traditional criminology and to the study of terrorism.

Environmental Criminology, Routine Activities Theory, and Opportunity Theory and their relevance to terrorism

Weisburd, Groff, Yang (2012) argue for a location-based approach to studying crime rather than the individual criminals. They state that crime “is bound tightly to place by specific characteristics of place” (Weisburd et al., 2012, p. 206). This study is important because it argues crime can be predicted when studied from a location-based approach. Criminological theories that focus on the individual criminal provide varying knowledge about what may lead an individual to commit a criminal act. However, by studying crime at place, developmental patterns of crime may be analyzed and can be addressed. Environmental criminology and routine activities of place are important place-based theories that can help us better understand how aspects of places matter to terrorism.

Environmental criminology theory explains criminal behavior through the context of the external environment’s influence on the location, the perpetrators, and the opportunity for criminal activities (Wortley & Mazerolle, 2008). The theory evaluates the locations in which crime has already occurred to determine what factors at those

locations contributed to criminal activities. This provides the ability to evaluate (and predict) other locations for the same variables (Schneider, 2005) and as potential places where crime opportunities might thrive. Environmental criminology also is associated with the practical focus of preventing crime “through analyses of spatial patterns in crime, perceptions, and awareness spaces of potential criminals, criminal mobility patterns, and the processes of target selection and decision to commit a criminal act” (Kennedy, 1990, p. 239). Thus, Kennedy (1990) argues that environmental criminologists are charged with the task of understanding “how specific targets may be selected and what factors enter into the thinking of the potential criminal before the decision to commit a crime is taken” (p. 243). The physical environment is the focus in understanding the thought process of potential criminals.

Jeffrey (1971,1977) asserted the physical environment is an important and fundamental aspect in criminal activities (as cited in Schneider, 2005). Criminologists, along with those involved with architecture and city planning aware of the research regarding environmental design, focus on crime prevention through environmental design, or CPTED (Bernard, Snipes, & Gerould, 2010, p. 25). Environmental design tries to disrupt the “social interaction dimension among criminals, victims, bystanders, and certain aspects of the environment” (Kennedy, 1990, p. 239). For example, as Schneider (2005) discusses, preventive environments often are thought to have natural surveillance, which discourages criminals from acting. Natural surveillance occurs by creating pathways, social activities, basic interaction, and general awareness of the surrounding environment (Schneider, 2005). Brantingham and Brantingham (1991) argue the primary

focus of crime prevention of environmental criminology is tracing and explaining normal movements in everyday life and separating the origin of the offender motivations from the physical space and showing crime patterns that are “born out of connections between geographic, environmental, and temporal patterns- not just from social, economic, and cultural contexts” (as cited in Schneider, 2005, p. 275).

Overall, the literature surrounding environmental criminology presents two main key ideas that are relevant in thinking about the influence of places on terrorism. First, environmental criminology focuses on places or locations for the causes of crime and the characteristics of those places. This theory focuses on the spatial analysis of crime rather than social, biological or psychological causes of crime. The theory provides an explanation that is applicable to all individuals rather than providing an explanation for criminal activities for a select subgroup of offenders. Location based approaches allow for the protection against potential attacks by fortifying locations against determined individuals.

Second, environmental criminology provides a possible solution to prevent criminal activities: target hardening, or altering the environment to reduce the opportunity for crime. This approach attempts to disrupt the interactions of offenders, victims, and location that create crime by instituting natural surveillance and other preventive techniques such as metal detectors and barriers. These main ideas are also found within the field of terrorism. Those that operate in terrorism and counterterrorism fields, both in theory and practice, attempt to disrupt the flow of opportunities for terrorist events. Disruption may include preventive techniques such as fortification of targets through the

use of barriers, a disruption in the flow of supplies, or blocking the flow of funding for terrorist operations. Environmental criminology can help analyze what makes a location desirable to an individual terrorist or terrorist group. Once location characteristics of terroristic events are analyzed, it follows that perhaps preventive policies and procedures may be implemented at those locations deemed to have a high vulnerability for attacks. For example, Lum, Kennedy, & Sherley (2006) found that certain place-based approaches are successful at reducing attacks at high vulnerability locations while others had no effect. Metal detectors were successful for reducing hijackings of airplanes while embassy fortification did not appear to reduce terrorism against those locations (Lum et al., 2006).

Theories related to environmental criminology focus on the ability to manipulate space and its environment to prevent and protect against crime. One prominent theory, attributed to Cohen and Felson (1979), is routine activities theory. Routine activities theory focuses on the convergence of likely offenders, suitable targets, and the absence of capable guardians against crime (Bernard, Snipes, & Gerould, 2010; Cohen & Felson, 1979; Felson, 2002; Groff, 2008; Sherman et al., 1989). The theory argues that without these three components of crime, the act of crime could not occur. Cohen and Felson (1979) argue that for a successfully completed crime to occur, crime requires “an offender with both criminal inclinations and the ability to carry out those inclinations, a person or object providing a suitable target for the offender, and absence of guardians capable of preventing violations” and a lack of any of these elements is normally sufficient to prevent such violations from occurring (p. 590).

Though routine activities theory does not attempt to discover what rationale the offender is operating under, routine activities theory bridges together the primary requirements of crime: the motivated offender, the suitable target, and missing preventive resources (Bosse, Elffers, & Gerritsen, 2010). In other words, routine activities theory attempts to provide an explanation for crime based on the characteristics of the place, making the location the unit of analysis. This approach is in contrast to most other theories that situate the individual offenders as the unit of analysis and focus on biological, social or cultural explanations for criminal activities (Clarke & Cornish, 1985; Weisburd, 2002; Weisburd et al., 2012).

As Cohen and Felson state (1979), these three aspects of routines (motivated offender, suitable target, and lack of capable guardianship) are the primary elements of crime. Felson (2002) later calls these three components the “chemistry of crime” (p. 20). The “chemistry of crime” is applicable to a variety of crimes including predatory crimes, assault and battery, illegal markets, and nonviolent crimes such as theft (Felson, 2002). Though these crimes are different from one another in nature and complexity, they are all the result of the routine activities of everyday life of offenders and victims in a certain location. Felson (2002) discusses the idea of “settings” in his analysis of the chemistry for crime. The setting is “where people converge or diverge to influence crime opportunities” which allows for the three components of crime to occur (Felson, 2002, p. 20). The setting, or the location, is essentially the “stage” that allows for crime to occur (Felson, 2002, p.21).

The location setting can create an opportunity for crime. Opportunity theory argues criminals evaluate a possible crime situation through a cost-benefit analysis to determine whether the activity is worth completing. Opportunity structures, as theorized and researched by Clarke (1995), describe both macro-level and micro-level environmental and location characteristics that can contribute to criminal activities. At the macro-level, there are broad social forces (for example, economic status of the region) that influence the standards of a region. More relevant to place-based attributes of crime are what Clarke (1995) discusses at the micro-level. Here, Clarke (1995) shows the interaction of victims, targets and facilitators as contributing to crime. Facilitators are objects or scenarios that allow for crime to occur. This can include a lack of capable guardians, available weapons or influencers like alcohol or drugs. These three characteristics of crime- victims, targets, and facilitators- are the result of the micro-level influences of routine activities or lifestyles and the surrounding physical environment.

The routine activities and environment elements of Clarke's (1995) opportunity theory are important because they can speak to either the cause of crime or the prevention of crime (p.102). These factors interact in a "complex interplay" that are the result of larger social problems (Clarke, 1995, p.103). Potential criminals observe their environment and learn about potential criminal activity locations from the media, peers, and simple lifestyle observations (Brantingham and Brantingham, 1991). Previously successful criminal activities in these locations then encourage potential offenders to create new opportunities based on the availability of victims and facilitators (Clarke,

1995, p.104). This leads to a clustering of crimes in a certain location based on the success found at these locations.

Various studies have been conducted on both the routine activities and opportunity structure theories, and some that have connected the two theories. For example, studies have looked at the phenomenon of “hot spots” in relation to routine activities theory. Sherman, Gartin, and Buerger (1989) tested predatory crime and found that crime does appear to be located at “hot spots” or limited to a few locations with a larger amount of crime (p.37). Despite the finding that there is variation across communities for crime, the study found the hot spots had similar locations, with most located on or near major roadways (Sherman et al., 1989, p. 43). The study also found that once a location suffered a crime, the location had a 26% increased probability of experiencing another crime, and the location would see an increase to 50% probability of a third crime or more crime (Sherman et al., 1989, p. 39). These findings suggest the convergence of routine activities may occur given certain location characteristics that may attract opportunity for crime to those places. The convergence of crime near major roadways suggests there is a possible relationship between location characteristics and crime. It can be inferred that a location that suffered a single crime is the result of routine activities, and after the first crime occurs, the crime itself can become a routine activity of the location. This finding is applicable to terrorism events. Perhaps there are aspects of locations that may provide greater opportunity for an event to occur, or where routines may converge to create this opportunity. Further, once a location suffers a terrorist event,

it becomes vulnerable to more because in the past it was proven to be successful to attack that location.

Groff (2008) further tested the theory of routine activities. Analyzing the crime of street robbery, she found that the temporal and spatial relationship between potential offenders and victims does impact the opportunity for crime (Groff, 2008, p. 105-106). Groff (2008) found agents that have “defined activity spaces” increase the risk or frequency of convergence because routines can be observed as a pattern (p.106). This is in contrast to those who do not have defined activity spaces, which leads to a decrease in risk or frequency of convergence. Through the lens of opportunity theory, “defined activity spaces” provide for a possible beneficial outcome for potential criminals because of the opportunity patterns created. Potential terrorists also may employ “defined activity spaces” to their advantage. When selecting a target, a terrorist may observe the setting and the routines that are presented and take action when a suitable pattern is observed.

Environmental criminology, routine activities and opportunity theory also can address the question of what is appealing about a target for a crime or a terrorist event. Opportunity theory focuses on the analysis by criminals to commit a crime after viewing the location characteristics. Environmental criminology provides an understanding of how a location’s physical characteristics can contribute to a criminal event while routine activities theory explains how a location can become vulnerable because of the convergence of targets, offenders, and lack of guardianship. Targeted locations are assumed to have these qualities based on these theories; however, the locations might differ in their particular vulnerabilities. For example, one location may have more human

guardianship compared to a second location that has more technology guardianship.

These possible differences in vulnerability lead to the question of whether the number of fatalities in terrorist events is related to different vulnerabilities of the locations.

The link between location and terrorism

Clarke and Newman (2006) argue that environmental criminology and routine activities can be used to understand terrorist events. Both theories emphasize the importance of location and setting for criminal activities. As Clarke and Newman (2006) state, in order to prevent attacks, testable theories must be developed that explain why and how terrorist groups act. Clarke and Newman (2006) further argue what is known about terrorism only addresses isolated and limited places, such as ports and transportation systems; however, they argue that these findings, in the broad spectrum of terrorism, the policies aimed at limited locations are irrelevant and difficult to implement for federal and police departments because of time and funding. Therefore, it is necessary to understand the characteristics of the events themselves to better evaluate potential targets.

Clarke and Newman (2006) argue for a theory and practical approach that limits the necessity of developing theories for each terrorism event, as this is unproductive use of time and funding for policy implementation. They instead argue for a theory that leads into a practical approach of understanding terrorist events in their entirety. Again, this approach reflects Clarke's more practical approach to thinking about crime and situational crime prevention more generally (Clarke & Cornish, 1993). Clarke and

Newman (2006) developed the Four Pillars of Terrorist Opportunity (p. 9). The pillars- targets, weapons, tools, and facilitating conditions- are “the result of technology, the physical environment of society, and the systems and services that help it to function” (Clarke & Newman, 2006, p. 9). Terrorists have limited time, funding, materials, and opportunity to carry out an attack. Therefore, considerable thought must be given when selecting a target. These targets, as Clarke and Newman (2006) argue, must be able to create media coverage and fear among the population. The targets are meant to become symbols and reminders of fear and vulnerability to future attacks (Martin, 2010; Tilly, 2004). As Clarke and Newman (2006) argue, location may determine both a terrorist’s behavior and a private individual’s behavior in that setting. Public gatherings, such as county fairs, bring together a large group of individuals for a common event. However, a private law firm only attracts those that work in that building.

These two situations present two different behaviors that are relevant in thinking about the relationship between location and terrorism. The first includes many unknown individuals who are socializing at an event. The second presents a group of known individuals who arrive at the location with a specific purpose in mind. The first situation is comprised of many strangers that do not have a connection to one another; therefore, there is a lack of recognition between the individuals creating a possible opportunity for a terrorist to commit an act. The situation presents a weaker form of human guardianship because it is more difficult to identify a suspicious individual. However, the second situation presents individuals who are assumed to recognize one another leading to less opportunity for a terrorist to commit an act because he or she may not be able to go

unnoticed. The regularity of the workers in the building creates a disadvantage to the terrorist because it may be more likely he or she is acknowledged as a stranger or not a member of the existing community. This situation presents a stronger form of human guardianship because of the ability to spot suspicious individuals. These two situations are important in regards to terrorism because the first situation may be more desirable for a terrorist attack compared to the second based on a cost-benefit analysis.

There have been recent empirical studies showing the importance placed on location by terrorists when selecting targets. Rusnak, Kennedy, Eldivan, and Caplan (2011) found that terrorist events in Turkey were concentrated in certain high-risk cities (p.179). Using the Global Terrorism Database, LaFree, Morris, and Dugan (2010) analyzed the risk patterns of the locations of terrorist events at the country level. LaFree et al (2010) found terrorist events tended to concentrate in certain countries more than others. Thirty-two countries were found to have high concentrations of terrorist events. This same study found fatal attacks were also subject to the country or location of the event (LaFree et al., 2010, p. 638). The countries with the highest concentrations of terrorist events were found to have the highest percentage of fatality rates (LaFree et al., 2010, p.637). LaFree, Dugan, Xie and Singh (2012) studied the spatial patterns and locations of ETA attacks in Spain from 1970- 2007. The study found that even though ETA expanded to different locations for terrorist attacks after 1979, ETA continued to carry out 61% of attacks in the local region of the Basque Autonomous Community (LaFree et al., 2012, p. 26). This implies that many terrorist attacks are often targeted at locations that have suffered previous attacks. This finding regarding terrorism is

supported by crime studies that found a home that had been burglarized had a higher chance of becoming a repeat burglarized home (Frank, Brantingham, & Farrell, 2012).

Webb and Cutter (2010) found that certain location types were more frequent given the type of surrounding environment. The study found that between the years 1970 and 2004 in the United States, government buildings were most frequently targeted within the cities of New York and Washington DC (Webb & Cutter, 2010, p.439). The study also found that abortion-related terrorism events centered in the “Bible Belt” of the United States. The location of private businesses was targeted most frequently in urban settings (Webb & Cutter, 2010). This finding implies the targets are often located in similar surroundings, such as an urban environment.

Since routine activities theory focuses on routines, opportunities, and environmental characteristics, it appears to be a theory that could produce successful crossover between traditional crime and terrorist attacks. As Clarke and Newman (2006) argue, terrorist attacks thrive from the ability to create fear and vulnerability in a group of people. Fear results from the unknown and from surprise. However, once more is known about terrorist events, locations can potentially be predicted to eliminate surprise and possibly eliminate future events themselves. If targets can be determined by protective agencies, precautions can be taken to target harden and discourage attacks. The practical ability to successfully use established criminological theory would create a vast and accessible knowledge base to understanding terrorism in locations.

Location types and characteristics selected for terrorist attacks may influence the number of fatalities that result. The location type may create a convergence of terrorist

opportunity and potential victims because of the routine activities of the location.

Different locations will attract a certain number of individuals and those locations with larger groups in the area will possibly create a larger number of fatalities from a terrorist attack.

Questions and Hypotheses

Environmental criminology, routine activities theory and opportunity theory each suggest that characteristics of places may matter in terms of the choices that terrorists make and the impact that terrorism may have on those locations. Environmental criminology focuses on the larger design and layout of the surrounding environment. Routine activities theory of place relates patterns of crime at places with the daily routines or activities of those individuals found in that particular location. It explains how offenders, victims or targets, and guardianship interact to enable or deter potential crime at a given location. Opportunity and rational choice theories explain the cost-benefit analysis a criminal completes before committing a crime and how opportunities can be presented or blocked to potential offenders. In this case, the cost-benefit analysis evaluates the characteristics of the potential location and whether these characteristics are conducive to crime. Combined with routine activities theory and environmental criminology, opportunity theory helps to explain why certain locations may be more attractive to offenders compared to others. Directly relevant to this study, these place-based theories may also help to better understand the potential consequences of a terrorist attack. Specifically, whether characteristics of locations contribute to greater fatalities

and what these characteristics of locations are that lead to a greater number of fatalities in terrorist attacks.

These three theories are potentially applicable to terrorism. Given the foundations of environmental criminology, terrorists would examine whether a general location is suitable for an attack. If a primary goal of the attack is maximum casualties, it could be assumed a more populous location would be selected. Therefore, it would be more appropriate to select a location in an urban setting rather than a rural setting. Place-based theories suggest a number of environmental factors may be connected to a greater number of fatalities that result from a terrorist attack. These factors included in this study are location type, human guardianship, technology guardianship, access to the location, population density, history of the location, unusual activities and time. Other factors unable to be covered in this study because of a lack of information are availability of transportation to and from the location and physical layout of the location at the time of the attack. All of these factors may lead to greater (or fewer) fatalities.

Based on the assumptions of routine activities theory, terrorist attacks would occur in locations with a consistent interaction of individuals with the target location. Attacks would occur in or near locations that were fully operating with a predictable pattern of arrivals and departures. Attacks would be less likely to occur in or near targets that have been abandoned by the local population. If the goal of a terrorist attack is a high number of fatalities, terrorist events would occur in or near targets that continuously and consistently draw a large number of individuals to the location.

If the goal of a terrorist attack is fatalities, the focus of opportunity theory suggests terrorism would occur in locations that provide the maximum number of fatalities. The benefit of the location (for example the number of fatalities possible), would outweigh the cost (for example the risk of being apprehended). Opportunity theory would further suggest terrorist attacks to occur in locations that provide terrorists with ability to prepare or setup the attack or to provide an escape route. This would decrease the risk involved in the attack, further contributing to the benefit of achieving maximum fatalities.

The locations would be selected by terrorists to achieve the assumed goal of maximum fatalities. Therefore, the most frequently targeted location will be one that has a consistently large population that would lead to a possibility of a high fatality rate per attack.

Thus, given the literature on environmental criminology, routine activities and opportunity theories, I hypothesize that:

1. There will be a relationship between the number of fatalities and the location type (for example, government or military, residence, business, transportation, or religious institution).
2. There will be a relationship between fatalities and environmental and routine activities characteristics of the location (for example, the variables of access, population density, human and technology guardianship, unusual activities, time, and history of the location).

Other variables will also be examined related to fatalities in terrorism events.

These include weapons, motives, and the method of attack of the terrorist organization that may also be important to understanding the fatal consequences of attacks. Given the close relationship between terrorist attacks and these variables, I also hypothesize that:

1. Certain weapons (for example, guns, bombs, planes, or biological weapons) will have more impact on fatalities in locations.
2. The consistent method of attack of the terrorist organization will have more success in producing fatalities.

Chapter 3: Data and Methods

Two inquiries will be answered by this study. Broadly, what are the characteristics of locations that terrorists tend to target? And more specific to this thesis: Is there a relationship between the physical and environmental characteristics of terrorism event locations (that can be ascertained) and the number of fatalities that result? To approach these questions, this study uses both qualitative and quantitative analyses. To begin, a sample of terrorism events were obtained from the National Consortium for the Study of Terrorism And Responses to Terrorism's (herein, "START") Global Terrorism Database. After as much information from the Global Terrorism Database (herein, "GTD") data could be obtained, each event was then analyzed using newspaper articles to gather more specific characteristics of the location of the event. Statistical procedures were then employed to determine whether there was a significant relationship between the location characteristics and attacks.

Data Source, Units of Analysis and Sample

The START program's Global Terrorism Database (GTD) at the University of Maryland was used to identify the sample of terrorism events used for this study. The START program began in response to the September 11, 2001 attacks in the United States with the goal of providing a database that analyzes terrorism on multiple

dimensions. The START program based its foundation on the Pinkerton Global Intelligence Service (PGIS), which collected and analyzed terrorism data between 1970 and 1997. With the contributions from PGIS, the START program's Global Terrorism Database is the largest and most comprehensive open-source data collection of terrorism demographics, dates of events, and organizations beginning in 1970 with over 98,000 individual terrorist events, and therefore will serve as the sampling for selection of the cases (LaFree & Dugan, 2007; START program, 2012). The Global Terrorism Database also includes terrorist attack incidents from countries all over the world, including those that are not industrialized or developed (LaFree, 2010). This allows for a greater analysis since data is from a wide variety of countries, not just countries that are industrialized, as is the case for crime data (LaFree, 2010).

The START program's Global Terrorism Database is the first database that provides a "comprehensive collection of terrorist events including both domestic and international incidents for several decades" (LaFree & Dugan, 2007, p. 198). The data found within the Global Terrorism Database not only provides for the analysis of impacts of specific policies, but also the potential for geospatial analysis. Seventy percent of the data carried over from the Pinkerton Global Intelligence Service (PGIS) has been geocoded to the city level while all new data collection entries are automatically geocoded (LaFree & Dugan, 2007, p. 198). The Global Terrorism Database names incidents as "terrorist" events when three conditions are met: first, "the incident must be intentional-the result of a conscious calculation on the part of the perpetrator"; second, "the incident must entail some level of violence"; and third, "there must be sub-national

perpetrators,” meaning the perpetrators do not have undeniable, stable control over a functioning government structure (LaFree & Dugan, 2007, p.188).

Though the development of the START program’s Global Terrorism Database provides the most comprehensive list of terrorist events to date, the data used in this study does have limitations. The database relies on accurate reporting from governments and news media in individual countries that suffer from terrorist events. This can lead to an incomplete list of events for two reasons. First, the individual country in question may not have an accurate news media reporting system. Second, governments may not release information regarding unsuccessful terrorist events, limiting the ability of the database’s collection of data. The GTD also lists some attacks as terrorism when many would not considered this coding to be accurate. For example, the school shooting at Columbine High School in Littleton, CO is included in the database; however, the school shooting at Virginia Tech in Blacksburg, VA is not included in the database. This selection of cases may call into question the accuracy of the definitions guiding the inclusion attacks in the database.

The GTD does provide information for the country and city of the attack. The database also provides the type of weapon used in the attack and the number of fatalities. However, regarding the current study, the GTD does not provide detailed information about the characteristics of locations of terrorism and a limited description of the target is provided. For example, the GTD categorizes targets as government, military, private citizen, or business. However, the GTD does not provide information about guardianship at these locations (either human or technological), access routes to the location, the

population density of the location, the time of the attack, whether unusual activities were occurring at the time of the attack, a history of the location in terms of past attacks, the common method of attack of the organization(s) involved in the terror event, or motives for the attack.

Despite these shortcomings, the START data provides a helpful starting point for this analysis, and determines the unit of analysis for this study- the individual terrorist event from the START program's database. More specifically, events used were those that satisfied a number of criteria developed for the purposes of this study. First, only events from 1990 to 2010 will be included in the analysis with the exception of 1993, which is not included in the Global Terrorism Database. The attacks that occurred in 1993 were lost during a location move at the START program (START, 2012). Second, any violent attacks that might be considered to be terrorist events that take place in developing countries will also be excluded from analysis. These countries include India, Pakistan, Iraq, Afghanistan, Palestinian territories, and the regions of South America, Latin America, Middle East, and Africa. Israel is also excluded from the analysis. These countries and regions have circumstances, such as ongoing civil wars, drug and cartel violence, and border disputes or are in the stage of country development, which would complicate comparing events with those that occur in developed and politically stable nations. Further, since this study relies on news sources for details of the attacks, only English-speaking countries were selected for this study. Thus, the countries that were included in this analysis are the United States, Great Britain, Ireland, Australia, Canada and New Zealand. Also, these countries rank low with violations of human rights on both

the State Department's Human Rights reports and the United Nations Human Rights Council reports and do not have current wars. Even though the United States and Great Britain are currently involved in war in Afghanistan and Iraq, these countries do not have ongoing war within each respective country's land borders, which can muddy interpretations of terrorism and conflict.

The Global Terrorism Database provides records of all terrorist events, including unsuccessful, failed, or thwarted attacks. However, only attacks that are categorized as "successful" by the GTD will be included in the study. The definition of "successful" is defined as those attacks which tangible effects resulted, specifically property destruction or killing of individuals, but not the perpetrators themselves or the perpetrators' property (START program, 2012). However, for this study, only attacks that involve victim death will be included in the analysis because of the research interest. Attacks that resulted in both victim and perpetrator death, such as the attacks of September 11, 2001, were included. Events that resulted in only perpetrator death were excluded. This is because physical injury and death tend to instill more fear and anger from the victimized population than property damage (Naftali, 2005). While it may have been interesting to compare successful with unsuccessful events, the research problem was that unsuccessful terrorist events often lack important data points to conduct any substantial analysis. Further, many unsuccessful events may not be released to the general public, which for this study was an important source of information regarding the location of the event.

A total of 104 terrorist events in the United States, Great Britain, Ireland, Canada, Australia, and New Zealand were successful and involved at least one fatality between

the years of 1990 through 2010. However, only 78 cases were able to be located using the newspapers. Therefore, the analysis includes 78 cases. A summary of this sample selection process is included in Table 1:

Table 1: Final Terrorism Event Sample from the Global Terrorism Database

Total number of events in the GTD	98,000
Only events between 1990-2010 (except 1993)	31,498
All events in US, Great Britain, Ireland, Canada, Australia, New Zealand from 1990-2010	1,054
Only successful events in US, Great Britain, Ireland, Canada, Australia, New Zealand	104
Only successful events with available information	78

Table 2 shows the distribution of the 78 terrorism events selected for the analysis. Most of the events in the sample used for this study occurred in the United States with 59%, while 23% occurred in Great Britain, 12% in Ireland, and 4% in Australia. No events occurred in New Zealand during the time period studied while Canada did not have any terrorist attacks that had substantial details that were available. However, the individual cities of London contained 15.4% of the number of events, New York City suffered 9% of the attacks, Washington DC witnessed 6% of the overall number of attacks, and Dublin contained 2.6% of the studied events. The remaining 48 attacks were completed in cities that only suffered a single successful attack in the given time period. Table 2 shows the frequency of attacks in the countries while Table 3 shows the frequency of attacks concentrated in five cities.

Table 2: Number of Terrorist Attacks per Country between 1990-2010 (n=78)

Country	Frequency	Percent
United States	46	59.0%
Great Britain	18	23.1%
Ireland	10	12.8%
Australia	4	5.1%
New Zealand	0	0.0%
Total	78	100.0%

Table 3: Most Frequently Targeted Cities between 1990- 2010 (n=78)

City	Frequency	Percent
London	12	15.4%
New York City	7	9.0%
Washington	6	7.7%
Miami	3	3.8%
Dublin	2	2.6%
Other*	48	61.5%

Figure 1 shows the number of fatalities per country between 1990-2010. The United States had the most fatalities from terrorist attacks at 3,245 fatalities. This high number of fatalities is a result of the attacks of September 11, 2001. Great Britain had 74 fatalities while Australia had 13 and Ireland had 9. Canada did not have any fatalities that were analyzed because of a lack of information provided by news sources.

* Other includes all cities that had only one attack during the time period of 1990-2010. The cities can be found in Table 4.

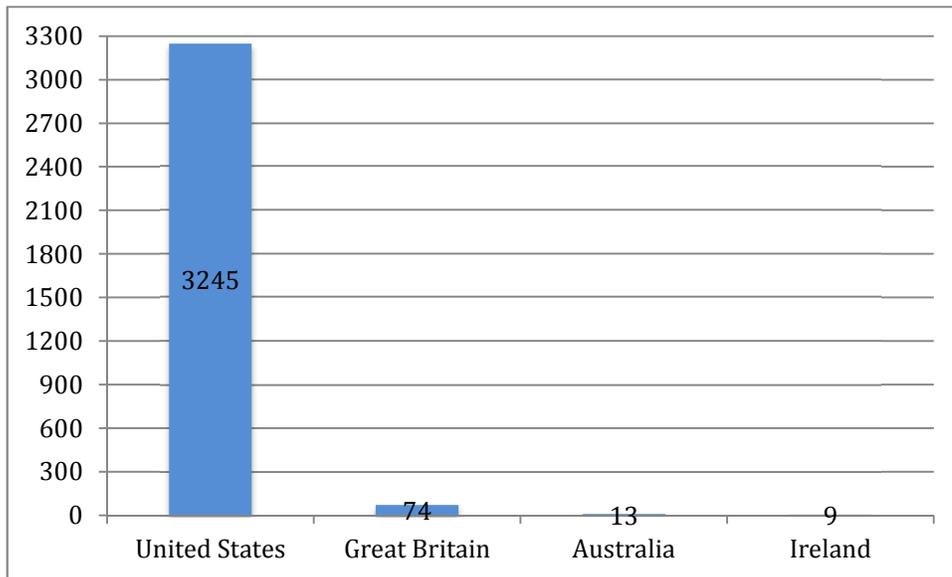


Figure 1: Number of Fatalities per Country between 1990-2010 (n=78)

Table 4 contains the complete list of terrorist events included in the study from the years of 1990-2010. The table contains the country and city that suffered the attack along with the number of fatalities that resulted. It can be seen from the table that the majority of the attacks resulted in a single fatality.

Table 4: Terrorist Events Included in the Study (n=78)

Date	Country	City	Fatalities
January 30, 1990	United States	Tucson	1
May 16, 1990	Great Britain	London	1
June 1, 1990	Great Britain	Lichfield	1
July 30, 1990	Great Britain	Hankham	1
September 22, 1990	United States	Bailey's Crossroads	2
November 5, 1990	United States	New York City	1
February 18, 1991	United States	Miami	1
February 18, 1991	Great Britain	London	1
March 15, 1991	United States	Miami	1
May 25, 1991	Ireland	Bucrana	1
June 21, 1991	Ireland	Millaghmore	1

July 18, 1991	Ireland	Riverstown	1
August 18, 1991	Australia	Sydney	8
March 11, 1992	United States	New York City	1
April 10, 1992	Great Britain	London	3
April 13, 1992	Great Britain	Derby	1
June 7, 1992	Great Britain	Yorkshire	2
August 21, 1992	United States	Bonnors Ferry	1
October 12, 1992	Great Britain	London	1
February 10, 1994	Ireland	Drogheda	1
March 1, 1994	United States	New York City	1
March 2, 1994	Australia	Adelaide	1
May 21, 1994	Ireland	Dublin	1
July 29, 1994	United States	Pensacola	2
August 18, 1994	Ireland	Ranelagh, Dublin	1
September 12, 1994	United States	Washington	1
September 12, 1994	Ireland	Dublin	Unknown
October 16, 1994	United States	Lubbock	1
October 25, 1994	Australia	Perth	1
December 30, 1994	United States	Brookline	1
December 30, 1994	United States	Brookline	1
April 19, 1995	United States	Oklahoma City	168
April 24, 1995	United States	Sacramento	1
October 9, 1995	United States	Hyder	1
February 9, 1996	Great Britain	London	2
February 18, 1996	Great Britain	London	1
February 23, 1996	Great Britain	London	1
March 5, 1996	Ireland	Bundoran	1
July 27, 1996	United States	Atlanta	1
November 1, 1996	United States	Tucson	1
February 23, 1997	United States	New York City	1
March 26, 1997	Great Britain	Wilmslow	Unknown
December 30, 1997	United States	Oakwood	1
January 29, 1998	United States	Birmingham	1
May 1, 1998	Ireland	County Wicklow	1
July 24, 1998	United States	Washington	2
October 23, 1998	United States	Amherst	1
April 20, 1999	United States	Littleton	17
April 30, 1999	Great Britain	London	2
July 1, 1999	United States	Redding	2
July 2, 1999	United States	Skokie	1
July 4, 1999	United States	Bloomington	2
March 8, 2001	Great Britain	London	1

September 11, 2001	United States	Shanksville	44
September 11, 2001	United States	Arlington	189
September 11, 2001	United States	New York City	1382
September 11, 2001	United States	New York City	1382
October 2, 2001	United States	Boca Raton	1
October 9, 2001	United States	Washington	2
October 15, 2001	United States	Washington	2
October 26, 2001	United States	Washington	Unknown
October 29, 2001	United States	New York City	1
November 14, 2001	United States	Oxford	1
July 4, 2002	United States	Los Angeles	3
July 7, 2005	Great Britain	London	14
July 7, 2005	Great Britain	London	7
July 7, 2005	Great Britain	London	27
July 7, 2005	Great Britain	London	8
April 4, 2006	Ireland	Glenties Village	1
July 25, 2008	Great Britain	Merseyside	1
July 27, 2008	United States	Knoxville	2
April 16, 2009	Australia	Darwin	3
May 30, 2009	United States	Arivaca	2
May 31, 2009	United States	Wichita	1
June 10, 2009	United States	Washington	1
November 6, 2009	United States	Killeen	13
February 18, 2010	United States	Austin	2
September 1, 2010	United States	Silver Spring	1

As shown in Table 5 below, unknown groups carried out 26 attacks totaling 33.3% of the events, while the Irish Republican Army carried out 14 of the events, and individuals committed 7 of the attacks. Al-Qa'ida, one of the most high profile terrorist organizations in western developed countries, only committed 8 of the analyzed terrorist attacks.

Table 5: Terrorist Organizations Responsible for Attacks between 1990-2010 (n=78)

Organization	Frequency	Percent	Valid Percent
Irish Republican Army (IRA)	14	17.9%	17.9%
Individual	8	10.3%	10.3%
Al-Qa'ida	8	10.2%	10.2%
Army of God	3	3.8%	3.8%
World Church of the Creator	2	2.6%	2.6%
Ulster Volunteer Force (UVF)	2	2.6%	2.6%
Macoute Sympathizers	2	2.6%	2.6%
Irish National Liberation Army (INLA)	2	2.6%	2.6%
Anti-Abortion Activities	2	2.6%	2.6%
Jamaat-al-Fuqra	1	1.3%	1.3%
Medellin Drug Cartel, Cali Narcotics Cartel	1	1.3%	1.3%
Minutemen American Defense	1	1.3%	1.3%
Neo-Nazi Group	1	1.3%	1.3%
Palestinians	1	1.3%	1.3%
Sons of the Gestapo	1	1.3%	1.3%
Ulster Freedom Fighters (UFF)	1	1.3%	1.3%
White Extremists	1	1.3%	1.3%
White Wolves (UK)	1	1.3%	1.3%
Unknown	26	33.3%	33.3%
Total	78	100.0%	100.0%

Dependent and Independent Variables

The characteristics of the location of each event were determined using two sources of information. First, the GTD itself collected some information about each event. These include the date, the country and city attacked, the number of fatalities, the

perpetrator, and the weapon. However, the Global Terrorism Database does not provide any information about the security or access of the target, the specific location of the target, and other characteristics such as population density in the location. Some of the specifics about the nature of the target and where it is located are not complete.

Since the database does not provide enough detail for analysis, information for each event will also be obtained from newspapers. The newspaper articles were used to build a more detailed understanding of the characteristics of that location by providing the important details and information needed to understand the location in its entirety. The newspapers will be chosen based on the reputation of reliable news reporting and the newspaper's interest in international news coverage. These newspapers are New York Times, the Wall Street Journal, the London Times, the Washington Post, Los Angeles Times, USA Today, and Chicago Tribune. If these newspapers do not provide enough detail regarding a particular incident, online reporting will also be used. These include CNN, Reuters, and the Associated Press. Newspaper articles will be selected for each event. Each article will be analyzed to determine information about the targets for terrorist events. Location characteristics will be coded to determine what characteristics each location possesses.

The information collected from the GTD was the number of fatalities, target, type of weapon, and perpetrator. The information collected from news sources included the type of location, human and technology guardianship, ease of access, population density, history of past incidents at the location, unusual activities, time of the attack, motive, and method of attack of terrorist organizations, including all dimensions of each variable.

Dependent Variable

The purpose of this study is to determine the nature of the locations that tend to be attacked, and also whether there is a relationship between the number of fatalities of a terrorist event and the characteristics of the locations of these events. Of particular interest are the characteristics such as the type of target (for example, government, business, residence, or transportation), known security and ease of access, and the population density of the area hit.

Thus, the dependent variable for this study is the number of fatalities per terrorist event. If the goal of a terrorist attack is maximum fatalities, the characteristics of the place may determine whether the location is selected for the attack or passed over for another location. The information about the number of fatalities was collected from the START database.

For this study, the variable of fatalities was collapsed into three categories for analysis. The categories are one fatality (coded as “1”), two fatalities (coded as “2”), and three or more fatalities (coded as “3”). Figure 2 shows the distribution of the number of fatalities per attack between 1990-2010. After collapsing the fatalities into three categories, it is revealed that fatalities are heavily skewed towards only one fatality per attack. The skew of the data may cause abnormalities in the results and may cause the interpretation of the data to be incorrect.

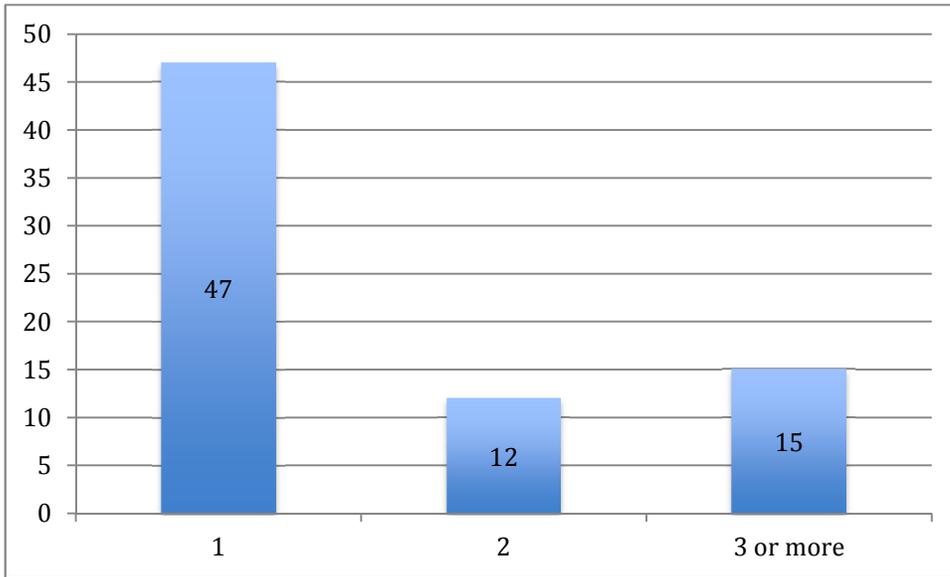


Figure 2: Distribution of the Number of Fatalities per Terrorist Attack (n=78)

Independent Variables- Location-based

There are eight location-based variables included in this study. The variables are location type, human guardianship, technology guardianship, ease of access to the location, population density at the location, history of terrorist attacks at the location, unusual activities occurring during the attack, and time of the attack. All of the location-based variables were collected through the use of news sources.

The Global Terrorism Database (GTD) provides general information regarding the location type of the attack. The GTD describes the target not the location. For example, for an assassination the GTD lists the target as an individual. In many cases, the target is not necessary information for the purpose of this study. Therefore, for the purposes of this study, location type was created. Newspapers were analyzed to understand the location of the attack. “Location type” refers to whether the location of the

attack was a transportation hub, transportation vehicle, recreational building, house, restaurant, school, religious building, or government building. Once the detailed information was collected from news sources, location type was collapsed into a numerical variable of five smaller categories of business (1), residence (2), transportation (3), government (4), and religious institution (5).

“Human guardianship” refers to human security presence that may contribute to the prevention of a terrorist attack or reduce the desirability of the location type. Human guardianship is defined in this study as the formal institutions of the police, military, or security guards and their presence at the time of the attack. “Human Guardianship” was collected by examining newspaper articles of each attack. This was coded as a dichotomous variable into “no” for a lack of human guardianship presence or “yes” for human guardianship presence.

“Technological guardianship” refers to the use of technological devices that supplement or replace human guardianship. These may include the presence of cameras, video recorders, metal detectors, or other forms of preventative devices. This variable was collected using news sources and was coded as “known” and “unknown”, where “known” means a technology guardianship was reported by the news source and “unknown” means the news source did not report a form of technology guardianship.

“Ease of access” is defined as the ability to locate and enter the location to carry out the terrorist attack. For this dimension, each location of a terrorist attack was coded as “public” or “private”. “Public” is defined as the ability for the general population to enter the location without special requirements such as a security badge, escort, or background

check. For example, public locations include restaurants, retail locations or malls, museums, transportation hubs, or city streets. “Private” is defined as a location that requires special permission (such as a security badge, escort, or background check) to enter or a location that does not allow any individual without official business to enter. For example, private locations include government buildings, such as the White House and the Pentagon, personal homes, or gated communities. For example, the attacks of September 11, 2001 were coded based on the individual targets. The Pentagon was coded as “private” because of its limited access by the general public. However, each World Trade Center building was coded as “public” because of the accessibility by the general public. This variable was collected from information provided by news sources.

The variable “Population Density” is defined by the amount of individuals that live, work, or visit the location and immediate surrounding area on a daily basis. Census data available categorized the population into smaller sets of numbers. However, the categories were collapsed for the purposes of this study into as low (<200,000), medium (200,001- 999,999), and high (>1,000,000). The exact daily numbers of the location cannot be analyzed from the day of the attack; however, the general census data and the reporting of newspapers is able to provide a better understanding of the population density of the location.

The variable “History” is defined as whether a location has a previous history of terrorist attacks. In this study, the location itself was analyzed for previous history, not the surrounding area. For example, the World Trade Center buildings had previously been attacked in 1993 by terrorists prior to September 11, 2001. Prior attacks were

included whether it was successful or unsuccessful. History of the location was collected from news sources and coded as a dichotomous variable labeled as “no” for no prior history of terrorism at the location and “yes” for a prior history of terrorism at the location.

“Unusual activities” are defined as activities that do not usually occur in a given location. For example, if the terrorism event occurred at a location in which a conference, festival, celebration, sporting event, election, or holiday was occurring that would be considered outside the normal routine of that location. This was coded as a dichotomous variable labeled as “yes” for the presence of an unusual activity and “no” for routine activities occurring in the location. The information for unusual activities was collected through news sources.

The variable “Time” is defined as the time of the attack at the location. This was coded as a dichotomous variable labeled as “day” if the attack occurred during the daylight hours and “night” if the attack occurred during the nighttime hours. This variable was collected from news sources.

Independent Variables- Non-Location Based

There are three non-location based variables included in this study. The variables are type of weapon, motive behind the attack, and the method of attack of the terrorist organization.

“Type of weapon” refers to the medium that allows the terrorist attack to be carried out. Weapon type includes guns, bombs, fire, planes, biological weapons, or

knives. Weapons are included in the study because the type of weapon often determines the ability to produce fatalities. This variable was collapsed into three numeric categories of gun (1) and bomb, plane, biological, or fire (2). Category 2 represents the weapons that are known to produce mass casualties. This variable was collected by the GTD.

“Motive” is defined by the reasons to commit the terrorist act. Motive includes political, religious, racism, or symbolism. For the purposes of this study, motive was collapsed into a dichotomous variable labeled as “political” or “religious”. Political comprises political, symbolic, and racist motivations while religious comprised only religious motivations. This variable was gathered from information provided by news sources.

The variable “Method of Attack” applies to typical location types of terrorist organizations or individuals. If there is a known pattern of location selection by a particular organization, these selected locations might have similar characteristics that make each a prime location in the opinion of that particular group. The variable was labeled as “matches the attack” when the attack matches previous locations attacked by the same group, “does not match the attack” when the location of the attack does not match past attacks, and “unknown” when the terrorist history is not reported or the group does not have an attack history. This variable was collected from information provided through news sources.

Table 6 summarizes the dependent and independent variables used for this analysis.

Table 6: The Dependent and Independent Variables

	Description	Source	Coded As
Dependent Variable			
Fatalities	Total number of deaths in a terrorist attack	GTD	Ordinal Variable; recoded as 1 (1), 2 (2), 3 or more (3)
Independent Variables			
<i>Location-based Variables</i>			
Location Type	The actual target that suffered the attack	GTD and Newspapers	Business (1) Residence (2) Transportation (3) Government (4) Religious (5)
Ease of Access	Entrance into the location	Newspapers	Public (1) Private (2)
Population Density	The number of individuals that reside in or travel to and from the location	Newspapers	Low= <200,000 (1) Medium= 200,001- 999,999 (2) High= >1,000,000 (3)
Human Guardianship	Police or security personnel	Newspapers	Yes (1) No (0)
Technology Guardianship	Technology such as cameras, metal detectors, scanners	Newspapers	Known (1) Unknown (0)
Unusual Activities	Whether there were any activities such as festivals, sporting matches, or conferences that disrupted the location	Newspapers	Yes (1) No (0)
Time	Describes when the attack occurred	Newspapers	Day (1) Night (2)
History of the Location	Describes whether the location had previously suffered an attack	Newspapers	Yes (1) No (0)
<i>Non-Location Based Variables</i>			
Weapon Type	Describes what weapon was used in the attack	GTD and Newspapers	Gun (1) Bomb, Plane, Biological, Other (2)
Motive	Describes the purpose of the attack	Newspapers	Political (1) Religious (2)

Method of Attack of the Organization	Describes the common approach to attacks used by the terrorist organization	Newspapers	Matches current attack (1) Does not match current attack (2) None (0)
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Method of Analysis

To examine these variables, this study will use two approaches. First, descriptive statistics of the locations of terrorist events will be presented. This will help to better understand the distribution of the variables. Second, crosstabulations between the dependent and independent variables will be presented to view any relationships between locations and non-location variables with fatalities. This provides information regarding what independent variables are significantly or not significantly related to the dependent variable of fatalities.

Limitations

There are limitations to the data used and method employed. LaFree (2010) states the Global Terrorism Database is limited to only the events that occur. It excludes those events that are foiled or for groups that use a different approach other than physical terrorism (LaFree, 2010, p.43). Therefore, foiled or new terrorist tactics are not included in this analysis. These attempted attacks are not included in the analysis because the availability of characteristic descriptions for the locations of potential targets is limited. This is because many suspected attacks did not reach fruition when discovered by law enforcement or officials did not release the prevented attack locations. Another reason is many terrorist attempts have not been released to the public and therefore the data would

not be available. This lack of knowledge regarding a location of an unsuccessful attack would skew the data and possibly provide a distorted picture of the locations.

The Global Terrorism Database also suffers from bias presented by news sources. The database relies on news reporting for its data collection; therefore, only those events that are considered newsworthy are included in the dataset and then the study (LaFree & Dugan, 2007). The news sources may only report on events that occur, not those that were unsuccessful or averted by authorities. More importantly, it is possible that less information is known about attacks in the regions of the world where news reporting is limited (LaFree & Dugan, 2007, p. 188).

A primary limitation of this study is the inability to analyze all terrorism cases from the Global Terrorism Database. For this study, events that occurred in countries hosting wars or continued border disputes were excluded. This excludes a large selection of events from analysis. Though many would argue that terrorist events that occur in war or continued disputes are counterinsurgent activities or acts of war, these events would most likely prove useful in understanding why and how locations are selected for attacks. Unsuccessful events are also removed from this study. The database does not contain information regarding unsuccessful events nor are newspapers equipped to provide analyses for events that do not occur.

The Global Terrorism Database is also limiting because it does not describe the events in great detail, forcing a reliance on news reporting. The database only provides the basic facts describing each event. However, the details, which are often the most important aspect in understanding an event, are not included. This creates the need to

look to other available resources for the information. In this case newspapers were relied upon.

A second limitation of this study regards the reliance on news reporting rather than first-hand research to determine the qualities of each event location. Content analysis is useful and reliable; however, it relies on the ability of others to report accurately the events and the details of the locations. The analysis is further only reliable based on how respected the data collection source is considered. The Global Terrorism Database has many opportunities for analyzing terrorism; however, the database is limited based on how accurate terrorist attacks are reported by the media and how many cases are censored by the government (LaFree, 2010).

A final limitation of this study is the fact that it cannot be determined whether certain groups target one type of location over another type. The study is only focused on determining whether characteristics of the location of terrorist attacks and the number of fatalities are related; it leaves out the dimension of specific terrorist group activities. This could be an important dimension of terrorism when a country needs to formulate a policy based on the primary threat group.

Chapter 4: Results

Descriptive Statistics of the Variables

The descriptive findings below provide better understanding of both the independent and dependent variables. As previously discussed in Chapter 3, the dependent variable of the number of fatalities per terrorist event was collapsed into three categories: one, two, and three or more fatalities. The mean number of fatalities is 1.73 with a standard deviation of 1.119. The fatalities variable is highly skewed towards a single fatality per terrorist event with outliers reaching to 1,382 fatalities in a single terrorist event (as shown in Figure 2 in Chapter 3 and reproduced below).

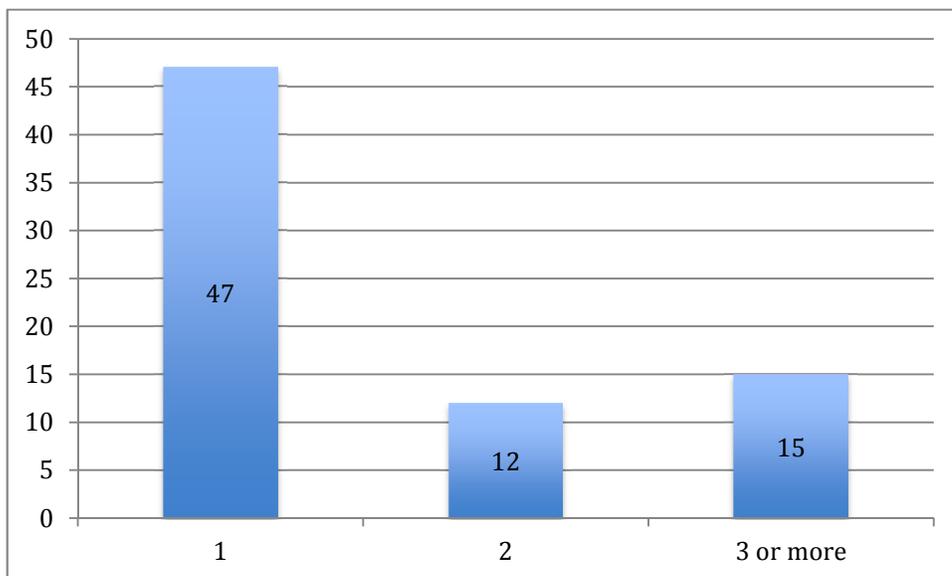


Figure 2: Distribution of the Number of Fatalities per Terrorist Attack (n=78)

Location-Based Variables

Table 7 below provides the descriptive statistics for the variables related to the location of each of the 78 incidents in this study: location type, human and technology guardianship, ease of access to the location, population density, history of terrorism at the location, unusual activities at the time of the attack, and time.

Table 7: Descriptive Statistics of Location-Based Variables (n=78)

Dependent Variable	Frequency	Percent	Valid Percent
Fatalities (mean= 1.73; SD= 1.119)			
1	47	60.3%	62.7%
2	13	16.7%	17.3%
3 or more	15	19.2%	20.0%
Missing	3	3.8%	
Independent Variables	Frequency	Percent	Valid Percent
Location Type			
Transportation	24	30.8%	30.8%
Government	19	24.4%	24.4%
Business	19	24.4%	24.4%
Residence	11	14.1%	14.1%
Religious Institution	5	6.4%	6.4%
Human Guardianship			
Yes	63	80.8%	80.8%
No	15	19.2%	19.2%
Technology Guardianship			
Unknown	54	69.2%	70.1%
Known	23	29.5%	29.9%
Missing	1	1.3%	
Ease of Access			
Public	56	71.8%	72.7%
Private	21	26.9%	27.3%
Missing	1	1.3%	
Population Density			
Low	29	37.2%	38.7%
Medium	17	21.8%	22.7%

High	29	37.2%	38.7%
Missing	3	3.8%	
History of the Location			
No	18	23.1%	52.9%
Yes	16	20.5%	47.1%
Missing	44	56.4%	
Unusual Activities			
No	69	88.5%	89.6%
Yes	8	10.3%	10.4%
Missing	1	1.3%	
Time			
Day	57	73.1%	81.4%
Night	13	16.7%	18.6%
Missing	8	10.3%	

Table 7 indicates modes of transportation were the most frequently targeted in 30.8% of the cases analyzed for this study. Both government locations and business locations were targeted in 24.4% of the attacks while residences were targeted 14.1% of the attacks. Religious institutions were only targeted 6.4%. Recall, that this study is limited to examining terrorism events in western, English-speaking, developed nations, which may bias these findings.

In 80.0% of the attacks, human guardianship was present when the attacks occurred. This finding may question routine activities theory's focus on prevention of crime (or terrorism) through guardianship. The variable "Technology Guardianship" was unknown in 69.2% of the attacks studied. However, when technology guardianship was known, 23 attacks were still carried out or 29.5% of the attacks studied. The large number of "unknown" regarding the presence of technology guardianship complicates the

interpretation of the results; however, the attacks that were carried out with known presence of technology may conflict with location-based theory assumptions.

71.8% of the attacks studied were carried out in the public space while only 26.9% of the attacks were carried out in private spaces. This implies that more individuals would be located at public locations rather than private locations, providing the opportunity for more fatalities. Terrorist attacks occurred most frequently at both population densities categorized as low (37.2%) and high (37.2%). The frequency of attacks occurring at the high population density would suggest a possible relationship with a high number of fatalities resulting. It can be assumed that those attacks that occurred at a low population density location may have only resulted in one fatality.

56.4% of the variable “History” of terrorism at a location was missing from news sources. However, of the known histories, 23.1% of the locations studied had no prior history of terrorism. 20.5% of the locations studied did have a prior history of terrorism. Based on frequency alone, this implies that a location without a prior history of terrorism may have the same chance of being attacked compared with a location with a prior history of terrorism.

88.5% of the terrorist attacks occurred during routine events. Only 10.3% of the attacks occurred during unusual activities, such as conferences, festivals, or sporting events. 73.1% of the terrorist attacks occurred during the daytime period. This implies that terrorist events, like crime, are more likely to occur during everyday life and routines at the target locations as opposed to planning attacks during special occasions or events.

Non-Location Based Variables

Table 8: Descriptive Statistics of Non-Location Based Variables (n=78)

Dependent Variable	Frequency	Percent	Valid Percent
Fatalities (mean=1.73; SD=1.119)			
1	47	60.3%	62.7%
2	13	16.7%	17.3%
3 or more	15	19.2%	20.0%
Missing	3	3.8%	
Independent Variable	Frequency	Percent	Valid Percent
Type of Weapon			
Gun	38	48.7%	49.4%
Bomb, Plane, Biological, Fire	36	46.2%	46.8%
Missing	1	1.3%	
Motive			
Political	66	84.6%	91.7%
Religious	6	7.7%	8.3%
Missing	6	7.7%	
Method of Attack of the Organization			
Matches the attack	18	23.1%	47.4%
Does not match the attack	15	19.2%	39.5%
No prior history	5	6.4%	13.2%
Missing	40	51.3%	

Guns were the prominent weapon used in 48.7% of events. This frequency is understandable because the fatalities were skewed around one fatality per attack and guns are often used in low fatality crimes. Bombs, planes, biological weapons and fire comprised 46.2% of the attacks. These are considered to be mass casualty weapons and the close frequency rate to guns suggests the attacks studied were evenly divided among the types of weapons.

In 79.5% of the attacks, the primary motive was political while the remaining attacks were based on religious motives. This suggests motive may be unimportant to the number of fatalities produced per terrorist attack. The method of attack of the terrorist organization appeared consistent in 23.1% of the cases with a known method of attack. 19.2% of the cases suggested the organization had changed their approach to the attack.

Cross Tabulations of the Location-Based Variables and the Number of Fatalities

To further discern the relationship between number of fatalities of each event and various characteristics of the location and incidence of those events, a number of cross tabulations were run. Table 9 shows the cross tabulations between location type and fatalities. As the Cramer's V statistic indicates, the type of location is not significantly related to the number of fatalities per terrorist attack. Table 9 indicates the majority of attacks that produced one fatality occurred at both business and transportation locations (29.8%). When there are four or more fatalities, transportation and government locations are targeted in 33.3% of the cases. This suggests that business locations may be selected when fewer fatalities are expected, such as assassinations. Transportation may also serve as a location for single fatality assassinations but also provides an opportunity for mass casualties. For example, in Ireland a British soldier was shot and killed while leaving a train cabin. Terrorists also attacked the British Underground producing 27 fatalities on a single train.

Table 9: Cross Tabulations for Location Type and Fatalities (n=75)

Location Type	Fatalities			Total
	1	2	3 or more	
Business	14 (29.8%)	2 (15.4%)	3 (20.0%)	19 (25.3%)
Residence	7 (14.9%)	3 (23.1%)	1 (6.7%)	11 (14.7%)
Transportation	14 (29.8%)	2 (15.4%)	6 (40.0%)	22 (29.3%)
Government	9 (19.1%)	4 (30.8%)	5 (33.3%)	18 (24.0%)
Religious	3 (6.4%)	2 (15.4%)	0 (0%)	5 (6.7%)
Total	47 (100.0%)	13 (100.0%)	15 (100.0%)	75 (100.0%)

Cramer's V value= 0.317, p= 0.482

Table 10 shows the relationship between human guardianship and fatalities. The tau-c correlation statistic between fatalities and human guardianship was barely significant (at the $p < .05$ level), suggesting cautiously that more fatalities were correlated to the *presence* of human security guardianship (recall, “yes” for human guardianship is coded as “1” and “no” is coded as “0”). Thus, despite the presence of human guardianship, all fatality categories saw an increase in terrorist attacks occur compared to no human guardianship presence. 91.7% of terrorist attacks that produced four or more fatalities occurred in the presence of human guardianship. For example, despite human guardianship at the airports and on the planes on September 11, 2001, this attack resulted in the greatest amount of fatalities included in this study. This finding may question the assumptions of location-based theories, particularly routine activities theory. However, it may be more likely that more fatalities result in locations with human guardianship

because the locations may be guarded based on their nature or the attractiveness for an attack at that location, or simply that more people are at that location.

Table 10: Cross Tabulations of Human Guardianship and Fatalities (n=75)

Human Guardianship	Fatalities			Total
	1	2	3 or more	
No	12 (25.5%)	2 (15.4%)	1 (6.7%)	15 (20.0%)
Yes	35 (74.5%)	11 (84.6%)	14 (93.3%)	60 (80.0%)
Total	47 (100.0%)	13 (100.0%)	15 (100.0%)	75 (100.0%)

Kendall's tau-c value= 0.151, p=0.058

Table 11 shows that technology guardianship is significantly related to the number of fatalities produced from terrorist attacks, but again, not in the expected direction. Specifically, fatalities appear to *increase* when technology is present: one fatality occurred in 19.6% of the cases with known technology guardianship presence, two fatalities occurred in 23.1% of the cases with known technology guardianship, and three or more fatalities occurred in 73.3% of the cases with technology guardianship. The findings appear to suggest fatalities increase in number with the presence of technology guardianship, questioning the assumptions of place-based theories. However, like human guardianship, technology may be increased in locations that are considered to be high priority locations. This in turn may lead terrorists to select the target because of its importance.

Table 11: Cross Tabulations of Technology Guardianship and Fatalities (n=74)

Technology Guardianship	Fatalities			Total
	1	2	3 or more	
Unknown	37 (80.4%)	10 (76.9%)	4 (26.7%)	51 (68.9%)
Known	9 (19.6%)	3 (23.1%)	11 (73.3%)	23 (31.1%)
Total	46 (100.0%)	13 (100.0%)	15 (100.0%)	74 (100.0%)

Kendall's tau-c value= 0.358, p=0.002

Table 12 indicates access type and number of fatalities are not significantly related. Across all fatality categories, the majority of attacks occurred in public locations. Of the cases that resulted in a single fatality, 71.7% occurred in public locations. Of the cases that resulted in two fatalities, 69.2% occurred in a public location and when three or more fatalities occurred in an attack, 73.3% occurred in a public location. One fatality resulted in a private location in 28.3% of the cases. This finding may suggest the assumptions of routine activities theory are not met. However, terrorist attacks that occur in public locations take place when there are more people, which may create more potential victims.

Table 12: Cross Tabulations of Access and Fatalities (n=74)

Access Type	Fatalities			Total
	1	2	3 or more	
Public	33 (71.7%)	9 (69.2%)	11 (73.3%)	53 (71.6%)
Private	13 (28.3%)	4 (30.8%)	4 (26.7%)	21 (28.4%)
Total	46 (100.0%)	13 (100.0%)	15 (100.0%)	74 (100.0%)

Kendall's tau-c value= -0.003, p=0.978

Table 13 indicates population density is not significantly related to the number of fatalities resulting from a terrorist attack. More attacks resulting in a single fatality occurred in population densities categorized as low (43.3%) while three or more fatalities resulted from attacks that occurred in highly populated locations (53.3%). Two fatalities appear to be evenly distributed among the three categories of population density. It appears that regardless of population density, the events with a single fatality most likely involved a single person in an assassination attack.

Table 13: Cross Tabulations for Population Density and Fatalities (n=72)

Population Density	Fatalities			Total
	1	2	3 or more	
Low	19 (43.2%)	5 (38.5%)	5 (33.3%)	29 (40.3%)
Medium	11 (25.0%)	4 (30.8%)	2 (13.3%)	17 (23.6%)
High	14 (31.8%)	4 (30.8%)	8 (53.3%)	26 (36.1%)
Total	44 (100.0%)	13 (100.0%)	15 (100.0%)	72 (100.0%)

Kendall's tau-c value=0.101, p= 0.309

Table 14 indicates that when a place has a history of attacks, the location is more likely to have a higher number of fatalities associated with a current attack. This could be a result that a desirable or prominent location is repeatedly selected. Similar to criminology findings of repeat burglaries (Brantingham & Brantingham, 1991), once a location has suffered a terrorist attack, it appears to be more likely to suffer a future attack.

Table 14: Cross Tabulations for History of the Location and Fatalities (n=33)

History	Fatalities			Total
	1	2	3 or more	
No	11 (68.8%)	3 (100.0%)	4 (28.6%)	18 (54.5%)
Yes	5 (31.3%)	0 (0.0%)	10 (71.4%)	15 (45.5%)
Total	16 (100.0%)	3 (100.0%)	14 (100.0%)	33 (100.0%)

Kendall's tau-c value= 0.386, p=0.023

Table 15 indicates the variable “Unusual Activities” is not significantly related to the number of fatalities resulting from terrorist attacks. As shown in Table 15, when one fatality resulted, the attack occurred in routine activities in 89.1% of the cases; when two fatalities resulted, the attack occurred in normal activities in 92.3% of the cases; and when three or more fatalities resulted, the terrorist attack occurred in daily activities in 86.7% of the cases.

Table 15: Cross Tabulations for Unusual Activities and Fatalities (n=74)

Unusual Activity	Fatalities			Total
	1	2	3 or more	
No	41 (89.1%)	12 (92.3%)	13 (86.7%)	66 (89.2%)
Yes	5 (10.9%)	1 (7.7%)	2 (13.3%)	8 (10.8%)
Total	46 (100.0%)	13 (100.0%)	15 (100.0%)	74 (100.0%)

Kendall's tau-c value= 0.007, p=0.930

Table 16 indicates the tau-c statistic is significant (at the $p < 0.05$ level) and negative suggesting that more attacks occur during the daytime hours (recall, which was coded as “1”) compared to nighttime hours (coded as “2”). The majority of single

fatalities occurred during the day (71.8%), the majority of two fatalities per attack occurred during the day (84.6%), and all of the attacks that resulted in three or more fatalities occurred during the day (100.0%). Fewer fatalities resulted during night attacks, suggesting these attacks were directed at specific individuals through assassinations. This finding is consistent with the assumptions of routine activities theory because it implies daylight hours create a convergence of terrorists and victims at a location.

Table 16: Cross Tabulations for Time and Fatalities (n=67)

Time	Fatalities			Total
	1	2	3 or more	
Day	28 (71.8%)	11 (84.6%)	15 (100.0%)	54 (80.6%)
Night	11 (28.2%)	2 (15.4%)	0 (0.0%)	13 (19.4%)
Total	39 (100.0%)	13 (100.0%)	15 (100.0%)	67 (100.0%)

Kendall's tau-c value= -0.232, p=0.003

Cross Tabulations for Non-Location Based Variables and the Number of Fatalities

Table 17 indicates the type of weapon is not significantly related to the number of fatalities. Guns most often resulted in a single fatality (60.5%). It is not surprising that guns often produced only one fatality in an attack because of the limited capabilities they provided. Weapons of mass casualties (bombs, planes, biological, and fire) resulted in the majority of three or more fatalities (73.3%). This is not surprising because these weapons are designed to produce more casualties per attack.

Table 17: Cross Tabulations for Weapon Type and Fatalities (n=71)

Weapon Type	Fatalities			Total
	1	2	3 or more	
Gun	26 (60.5%)	8 (61.5%)	4 (26.7%)	38 (53.5%)
Bomb, plane, biological, fire	17 (39.5%)	5 (38.5%)	11 (73.3%)	33 (46.5%)
Total	43 (100.0%)	13 (100.0%)	15 (100.0%)	71 (100.0%)

Cramer's V value= 0.279, p=0.063

Table 18 indicates motive is not significantly related to the number of fatalities produced from a terrorist attack. 92.8% of the attacks were motivated by political reasons while only 7.2% were solely linked to religious motivation. Often, political and religious motivations cannot be separated from one another. For example, Al-Qa'ida is a fundamental Muslim organization but the organization has political goals they wish to achieve through terrorism.

Table 18: Cross Tabulations for Motives Against Fatalities (n=69)

Motive	Fatalities			Total
	1	2	3 or more	
Political	40 (90.9%)	11 (91.7%)	13 (100.0%)	64 (92.8%)
Religious	4 (9.1%)	1 (8.3%)	0 (0.0%)	5 (7.2%)
Total	44 (100.0%)	12 (100.0%)	13 (100.0%)	69 (100.0%)

Kendall's tau-c value= -0.058, p=0.230

Table 19 indicates the method of attack of the organization is not significantly related to the number of fatalities the result from a terrorist attack. It appears that

repeating the same location type for an attack is more important with lower fatalities. For example, single fatalities occurred 81.1% in location types that were considered to be similar to other locations attacked by the same group. Repeat location type was also important in producing three or more fatalities. 80.8% of three or more fatalities occurred in a similar location type by the same organization. *

Table 19: Cross Tabulations for Method of Attack of the Organization Against Fatalities (n=36)

Method of Attack	Fatalities			Total
	1	2	3 or more	
None	2 (9.1%)	0 (0.0%)	1 (10.0%)	3 (8.3%)
Matches Attack	18 (81.1%)	2 (50.0%)	8 (80.0%)	28 (77.8%)
Doesn't Match Attack	2 (9.1%)	2 (50.0%)	1 (10.0%)	5 (13.9%)
Total	22 (100.0%)	4 (100.0%)	10 (100.0%)	36 (100.0%)

Kendall's tau-c value= .051, p= .617

- While exploring the variable “Fatalities”, it was further collapsed into 1 fatality and 2 or more fatality. However, no significant findings were discovered.
- Ordinal regression was run to discover any other significant relationships. However, no significant relationships were discovered between fatalities and the independent variables.

Chapter 5: Discussion

The complexity of terrorism may not be simply understood by one single criminological or sociological theory. Viewing terrorism through multiple theories or lenses could provide a well-rounded and more detailed description of the phenomena. In order to achieve this, policymakers might consider different theoretical approaches to understand and ultimately prevent terrorism. The fields of criminology, economics, sociology, psychology, and political science have all contributed studies in the effort to better understand terrorism. However, viewing terrorism through these different lenses separately also leaves gaps in knowledge. Researchers might consider developing terrorism-oriented theories. As the findings in this study suggest, terrorism has many different elements that are unable to be explained by a single existing criminological or sociological theory.

Environmental criminology, routine activities theory, and opportunity theory suggest location characteristics may influence whether a terrorist attack will be successful by resulting in fatalities. Routine activities theory stipulates that for crime to occur, a motivated offender, a suitable location, and a lack of guardianship must converge in a given location. These three elements provide the setting for traditional crime. However, when applied to terrorism events, it is less certain what the relationship is between location and terrorist attacks. Routine activities theory, and place-based theories in

general, do not seem to adequately address the question of “how many” fatalities will result in a terrorist attack and whether characteristics of places could predict the number of fatalities. The location-based theories may only answer the question of “where” attacks take place, as Clarke and Newman (2006) suggest.

Location type was not significantly related to the number of fatalities per terrorist attack. This conflicts with the assumptions of location-based theories. Based on routine activities theory and environmental criminology, the location type should be a primary variable in determining the success of and the number of fatalities that could result from a terrorist attack. However, a variety of location types produced a wide range of fatalities. It was shown that government and transportation locations were more likely to result in a larger number of fatalities; however, it appears transportation is also an appropriate location to conduct attacks that result only in a single fatality. Businesses or residences were not appropriate locations for large-scale attacks but were conducive to one or two fatalities per attack. This suggests that location type may be viewed as a medium to completing an attack. The location type may not be the goal of the attack but rather, the setting for the final goal. The final goal may differ between organizations; however, similar locations appear to be used to complete these different goals.

The variables of human guardianship and technology guardianship present interesting findings that conflict with routine activities theory. Human guardianship was barely significantly (at the $p < .05$ level) related to fatalities while technology guardianship was significantly related to the number of fatalities. When human guardianship was present, more fatalities resulted. This questions the assumptions of

routine activities theory. The theory suggests that when guardianship is present, crime or attacks are less likely to occur. Terrorism appears to change this assumption. Human guardianship may create a convergence of more people in a select location, thereby creating more opportunity for a greater number of fatalities. However, it cannot be determined whether human guardianship led to an attack because only successful attacks were studied. More human guardianship may also create a sense of more reward because of the ability to succeed despite preventive measures. For example, the events of September 11, 2001 occurred in the presence human guardianship (along with technology guardianship) both at the airports and on the airplanes. However, with the exception of the final plane, the attack was successfully carried out, creating embarrassment, frustration, and changes to procedures at airports and on airplanes.

Technology guardianship was statistically significantly related to the number of fatalities. This finding is supported by the assumptions of routine activities theory. However, the distribution of the fatalities calls into question whether technology guardianship prevents fatalities or increases the number of fatalities per event. The findings could, however, be spurious (as could many of these other findings, given the limited nature of this analysis). Technology guardianship is often found in location types that are considered to be important or popular locations. Therefore, technology guardianship would not *cause* more fatalities; rather, technology guardianship may only be found in locations that are considered important locations or that have more individuals converging at that location. The importance of the location is often

considered when selecting a terrorism target; therefore, technology guardianship would be found at that location.

Ease of access to the location and the number of fatalities were not statistically related. This finding could be a result of being measured incorrectly (recall, ease of access was coded as “public” for locations that do not require government identification or limit general access and coded as “private” for locations that require special access documentation or limits the access by the general public). However, this finding may question the assumptions of location-based theories, especially those of routine activities theory. Routine activities theory suggests that when there is a convergence of terrorists, victims, and a lack of guardianship in a location, fatalities would result. This convergence would most likely occur during routine activities in the public space. However, as seen in many instances, assassination appears to be the exception. It was shown in the findings that single fatalities occurred more often in the private space compared to the public space. This could be explained by routine activities theory. In the private space, there is potentially less guardianship preventing one fatality compared to more guardianship in the public space. This finding suggests it may be more difficult to assassinate a single individual in public compared to private. However, when targeting a larger population, the public space presents more opportunity for fatalities by creating a larger and more convergence between terrorist, victim, and lack of guardianship at a location.

The findings for population density present an interesting conflict with routine activities theory and opportunity theory. The finding suggested population density was not significantly related to fatalities; however, both of these theories would suggest more

fatalities would result when the population density is high. More individuals in a location would provide more opportunities for fatalities because there are more potential victims. However, the chi-square test indicated fatalities were almost equally distributed among the categories of population density. The different forms of terrorism included in this study may explain the distribution of fatalities across the different population densities. For example, terrorists conducting an assassination may not wish to attempt this attack in a crowded location. However, attacks targeted at a general population would most likely occur in larger populations. Lower population densities provide more opportunity of a successful assassination because of less possible collateral fatalities while high populations present an opportunity for an undetermined number of fatalities.

The findings for the history of terrorist attacks at a single location follow the conclusions of repeat victimization and repeat burglary studies. Brantingham and Brantingham (1991) found that houses that were burglarized were more likely to have a repeat burglary crime. This is seen in some of the cases in this study. For example, the World Trade Center was successfully attacked in 1993 and then again in 2001 by Al-Qa'ida. The London underground has repeatedly been attacked by both the IRA over the course of many years and then attacked by Al-Qa'ida in 2005. Repeat locations suggests the most vulnerable locations may be those that have already suffered either a successful attack (one which produced fatalities) or one that was considered to be unsuccessful by this study.

Terrorist attacks appear to take place primarily during routine activities. The majority of the attacks occurred during uneventful and normal, daytime events. This

follows the assumptions of routine activities theory because normal lifestyles often force individuals to be outside in the public locations during the daytime hours. Perhaps terrorists are able to plan more successful attacks that occur during these time periods because there are observable lifestyle patterns. Daytime hours also present more opportunity for fatalities because more individuals tend to be in the public during this time. Potential terrorists are able to document guardianship presence, population density and patterns, and other activities that occur in the location during the day. Place-based theories suggest this interaction between terrorists and victims is important to preventing attacks; however, it appears to produce more fatalities.

With regard to non-location based variables and the number of fatalities of events, this study explored the type of weapon, the motive, and the method of attack of the terrorist organization. Weapons are important to any terrorist attack. The type of weapon often implies what form terrorism will take and how many fatalities will be produced. Guns were most often used during assassination attacks while bombs, planes, and biological weapons were used when attempting to produce mass casualties. Weapons also imply the goal of the attack. With a few notable exceptions, such as the Mumbai, India shooting spree in 2008 (which was not included in this study), guns are primarily used in attacks that only target one or two individuals. Bombs, planes, and biological weapons are targeted at a general population. Weapon choice may depend on the motivation of organization and the goal of the attack.

Bombs are primarily used in terrorist attacks. Bombs can provide the terrorist with anonymity because most can be placed at a location hours before the attack. Bombs

also are a weapon that often causes mass fatalities in an attack. However, the results indicate guns were used in 38 attacks and bombs were used in 36 attacks included in this study. Guns were used primarily in assassination. Of the attacks studied, 40 fatalities resulted from assassinations completed with the use of guns. This comprised 43.6% of the attacks studied. This implies that terrorist attacks in western democracies are closely divided between assassinations and other forms of terrorism.

As can be seen from the cases analyzed in this study, groups or individuals can be motivated to commit an act of terrorism for many reasons, including political convictions, religious beliefs, and personal convictions such as the morality and racism, and symbolism. However, these seemingly separate categories cannot be easily disentangled from one another. Terrorism has many different facets that often can overlap or coincide with seemingly separate ideologies. While some events are motivated by one cause, such as the belief that abortion is immoral, other events are more complicated. For example, the events of September 11, 2001 are often considered political, religious, and symbolically driven. Following the release of many Osama Bin Laden tapes after September 11, 2001, it became known that the Al-Qaida organization disapproved of the United States' involvement in Middle East affairs and the support of Israel. It was established that the organization disapproved of the United States' morality and believed Islam to be the superior religious foundation. Finally, the attack itself was focused on the symbols of the United States: the World Trade Center represented the economic strength and global domination of the country while the Pentagon represented the military presence and strength throughout the world. The final location, debated between the

White House and the Capital, represents the fundamentals of the United States' government.

The different motives justifying terrorism may lead to different locations of terrorism. For example, religious terrorism is often targeted at religious buildings, conferences, or gatherings. Political terrorism is often targeted at government buildings, military installations and sometimes at individuals representing the government. Terrorism may be directed at any high profile or symbolic building that represents a certain element of a country or people that is considered to be the target. The motives often direct the terrorist or terrorist organization to the intended location. The various motives also may cause different forms of terrorism. Assassinations are targeted at a specific individual while bombs placed in on a mode of transportation are targeted at a general population. This difference may affect the understanding of location characteristics that are important in facilitating an attack.

Perhaps the most important aspect of motivation is what is fundamental to terrorism: terrorists often do not care whether they live or die during an attack; therefore, it is difficult to prevent an attack when the perpetrator does not care for his or her own welfare. Preventive measures may be in place that would deter common criminals; however, an individual or organization that considers the perpetrator a martyr for a cause presents new challenges. Individuals without a desire for life after an attack may present counterterrorism officials with limited options for preventive measures.

The relationship between the method of attack of the terrorist organization and the number of fatalities was not significantly related. However, method of attack of the

terrorist organization suggests that attacks result in more fatalities when the organization selects similar targets they have attacked in the past. This implies that terrorist organizations may prefer a location type they have found successful in producing fatalities.

The overall findings of this study suggest that the relationships between location-based characteristics and the number of fatalities that result from a terrorist attack are not clear. Many of the results appear to question the assumptions of environmental criminology, routine activities and opportunity theory; however, upon closer analysis, the relationships could be spurious. This ambiguity is a result of the natural difficulty of terrorism data. The goal of terrorism is often different from the goal of traditional criminal activities. Therefore, as suggested by some of the findings, especially human and technology guardianship, those variables that prevent traditional crime may make targets more desirable for terrorism purposes. This does not imply causation between the variables and fatalities; rather, it may imply that the act of preventing crime at places suggests these places are important and populous locations, which are often the primary targets of terrorism attacks.

Limitations of the Findings

This study was limited in the sample size and scope of included countries. The results found for Western, English speaking, and developed nations may not predict or match the results found in other regions of the world. Nations that suffer from more political unrest, religious intolerance, general developmental issues, and internal conflicts

may present different findings, therefore providing different policy options. Countries not included are often fundamentally different than the Western, English speaking countries included in the study. Applying the findings to inherently different countries could result in wrong policy decisions or incorrect assumptions about terrorism. Therefore, the findings are limited to only the countries studied.

This study only analyzed successful terrorist events that resulted in at least a single fatality. Therefore, the findings cannot be applied to events that do not result in any fatalities. Unsuccessful terrorist attacks at locations may have similar characteristics to one another. These characteristics may provide better insight as to what characteristics make a terrorist event successful compared to unsuccessful.

This study also is limited in the results because of possible insufficient statistical power. Many of the cross tabulations between the independent variables and the dependent variable “Number of Fatalities” saw cells that resulted in too few cases which may misrepresent the overall findings. Other variables, in particular “Motive” saw little variation that may cause the chi-square test to produce incorrect findings.

It has been argued that the field of criminology may not be the best equipped to study terrorism. However, those that support criminologists studying terrorism are divided on which theories should be applied to understanding the events. Many could argue that existing traditional crime theories, such as routine activities theory, opportunity theory, and environmental criminology, are not applicable to terrorism and do not address the fundamental aspects of terrorism. Based on the findings of this study, it may be suggested to look at terrorism through more social and psychological theories.

Those that do not agree criminologists are equipped to study terrorism argue that traditional criminal theory cannot be applied to terrorism. Crime theory was developed to examine and explain everyday crimes. Crime theory, however, may not be applicable to terrorism. As a rare event compared to crime, terrorism may not be as common as it is required by some criminological theories. The rarity of terrorism poses the challenge of understanding the phenomenon through a lens that analyzes common events. This difference could be large enough to exclude many theories in the field of criminology from analyzing terrorism.

Further Research

The study does not suggest that location based approaches will be able to diminish the risk of terrorist events. However, the findings may be flawed because of how the data was collected and coded. Therefore, including unsuccessful or nonfatal attacks may provide greater insight into the influence of location characteristics.

The findings in this study suggest there is a need to explore terrorism through different criminological theories. Though the theories of routine activities, opportunity, and environmental criminology are often considered to be successful and applicable to explaining tradition crime, terrorism appears to be more complicated than the theories are equipped to handle. However, because of the limited sample size and scope, further research should be conducted on the remaining countries and events to determine whether these theories are applicable to more mass casualty events. Clarke & Newman (2006) present a logical argument for the use of location-based terrorism understanding and

prevention. However, until further studies are conducted on more terrorist attacks using location-based variables, it remains unknown how effective this approach may be in preventing attacks.

Other research opportunities may be found in the criminological theories of social anomie, social disorganization theory and strain theory. These three theories focus on the social aspects as to why traditional crime occurs. The three theories emphasize crime is caused by a disconnect between an individual and the society, leading to strain on the individual. The strain then causes an individual to break away from traditional norms and commit crime (Bernard, Snipes & Gerould, 2010). These theories would create a study that does not analyze terrorism as a location based event but rather as a social creation.

Future studies should also focus on the unsuccessful terrorist events that do not result in fatalities. It is possible that new details about location can be learned through analyzing unsuccessful terrorist events. Prevented terrorism opportunities should also be studied. It is possible a better understanding of terrorism may be gathered by analyzing the locations that did not result in fatalities compared to the locations that did suffer fatalities. Failed terrorism attempts may provide greater insight into the characteristics of locations that are more desirable for terrorism. Unsuccessful events should also be analyzed using different criminological theories to better understand the different dynamics in a successful event compared to an unsuccessful event.

Policy Implications

The findings from this study leave questions unanswered regarding terrorism and counterterrorism policies. First, the skewed nature of the number of fatalities per attack questions the traditional thought that terrorism results in a large number of fatalities. However, the majority of the attacks in this study were assassinations. This is an important question to analyze in future studies because the answer could change how counterterrorism is viewed and how terrorism is prevented in Western developed countries.

Second, these findings suggest that traditional approaches to counterterrorism may not yet be abandoned. Traditional counterterrorism is considered to be military intervention or another form of violent intervention. The question remains: can this counterterrorism approach be abandoned for a terrorism prevention approach? Clarke and Newman (2006) argue for a counterterrorism approach that focuses on terrorism prevention at locations. However, based on these findings, the preventive approach at locations may not be strong enough to prevent terrorist attacks. For example, technology guardianship appears to be more prevalent when four or more fatalities occur. Counterterrorism policy may need to incorporate both the traditional approach and develop new preventive measures. Researching new measures is beyond the scope of this study; however, this study suggests the preventive measures in place are not able to prevent large-scale fatality attacks.

Chapter 6: Conclusion

This study analyzed whether there is a relationship between the location of characteristics and the number of fatalities that result from a terrorist attack using the Global Terrorism Database and leading newspapers. Based on the theoretical foundations of environmental criminology, routine activities and opportunity theory, it was hypothesized the location characteristics of location type, human and technology guardianship, ease of access, population density, history of the location, normal activity at the location, and time would be related to the number of fatalities. The non-location based variables of type of weapon, motive and method of attack of the terrorist group were also tested. However, only technology guardianship, time, and method of attack of the organization were significantly related with the number of fatalities that resulted per terrorist attack.

Based on the findings, questions remain regarding the appropriateness of applying the location-based theories of environmental criminology, routine activities, and opportunity to terrorism. As shown in the findings, the dimensions of terrorism are different from that of crime and the rarity of terrorism compared to criminal activities may affect the applicability of criminological theories. The broader question posed at the beginning of this study still persist: Can criminological theories speak to the study of terrorism and counterterrorism?

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Curriculum Vitae

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