

Assessing the Effectiveness of High-Profile Targeted Killings in the “War on Terror” A Quasi-Experiment

Jennifer Varriale Carson

University of Central Missouri

Research Summary

Since the attacks of September 11, 2001, and the ensuing “war on terrorism,” the U.S. government has engaged in a series of controversial counterterrorism policies. Perhaps none is more so than the use of targeted killings aimed at eliminating the senior leadership of the global jihadist movement. Nevertheless, prior research has yet to establish that this type of tactic is effective, even among high-profile targets. Employing a robust methodology, I find that these types of killings primarily yielded negligible effects.

Policy Implications

Given the immense controversy surrounding the policy of targeted killings, it has become that much more vital to assess whether such measures are effective. This study’s findings, that most of these high-profile killings either had no influence or were associated with a backlash effect, have important implications for future counterterrorism efforts. All in all, the U.S. government’s investment in the policy of targeted killings seems to be counterproductive if its main intention is a decrease in terrorism perpetrated by the global jihadist movement.

This research was supported by the Office of University Programs Science and Technology Directorate of the U.S. Department of Homeland Security through the Center for the Study of Terrorism and Behavior (CSTAB Center Lead) Grant made to the START Consortium (Grant # 2012-ST-61-CS0001). The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security, or START. Special thanks to Marijana Kotlaja, Allison Swopes, and Matthew Suppenbach for their help with these data. Direct correspondence to Jennifer Varriale Carson, Department of Criminal Justice, University of Central Missouri, Humphreys Building, Room 301C-1, Warrensburg, MO 64093 (e-mail: jcarson@ucmo.edu).

Based on the expansion of Public Law 107–40, Authorization for Use of Military Force, in 2001, targeted killings are justified as a “necessary and appropriate force . . . in order to prevent any future acts of international terrorism against the United States by such nations, organizations, or persons.” Despite this justification, there is little empirical evidence to substantiate these claims of prevention. Fortunately, criminologists have recently applied a set of unique and robust quantitative methods to address similar deficits in the terrorism and counterterrorism literatures. By following this line of research, a thorough quasi-experimental design was applied in the current study to address the following research question: *Has the U.S. policy of high-profile targeted killings decreased global jihadist terrorism?*

Targeted killings, defined by Alston (2010) as the “intentional, premeditated and deliberate use of lethal force, by States or their agents acting under colour of law, or by an organized armed group in armed conflict, against a specific individual who is not in the physical custody of the perpetrator,” (p. 3) have been heavily criticized by the international community. The practice of targeted killings most often takes two forms: kill/capture¹ missions and unmanned aerial vehicle assaults.² Estimates of the number of fatalities associated with the former practice vary widely given the inherent secrecy behind the program. Certainly the most infamous of fatalities is that of the May 2, 2011 Navy SEAL raid on Usama bin Laden’s Pakistan compound. This event was predated by several missions, including the June 8, 2006 targeted bombing of Abu Musab al-Zarqawi’s safe house in Iraq. al-Zarqawi was labeled as a “most wanted” al-Qa’ida leader because of his participation in especially brutal attacks like that of beheadings (Burns, 2006). At the time, American Ambassador Zalmay Khalilzad cautioned that al-Zarqawi’s death should not be considered the end of violence in Iraq, but he did note that it was an “important step in the right direction” (Burns, 2006: para. 3).

The use of the latter type of targeted killing, that of unmanned aerial strikes, is likely to have originated with the November 3, 2002 killing of Senyan al-Harethi. al-Harethi was chosen as a target for his role in organizing the *USS Cole* bombing, a suicide attack that killed 17 and wounded 39 others (Alston, 2010). Strikes such as the one against al-Harethi have become much more widespread under the Obama administration (Van Linschoten and Kuehn, 2012) with Radsan and Murphy (2011) estimating 118 in 2010 alone.³ Perhaps the most divisive of these given his U.S. citizenship is the killing of radical Muslim cleric, Anwar al-Awlaki, on September 30, 2011, in Yemen. al-Awlaki was suspected of radicalizing Major Nidal Hasan, the perpetrator of the Fort Hood, Texas, shooting that killed 13 people and

1. Obviously, targeted killings only involve the former outcome.

2. Targeted killings have also involved “sniper fire, missiles from helicopters, gunships, the use of car bombs, and poison” (Alston, 2010: 4).

3. This number is nearly impossible to verify given the secrecy of the program. It is also important to acknowledge that it conflicts with other estimates like that of Alston’s (2010) 120 total drone strikes.

injured 30 others. Furthermore, Umar Farouk Abdulmutallab, convicted for his attempt at blowing up an airplane on Christmas day, was alleged to be associated with al-Awlaki. Samir Khan, also a U.S. citizen and editor of al-Qa'ida's online magazine *Inspire*, was killed in the same drone strike. After their deaths, President Obama remarked that this event was a "major blow to al-Qaeda's most active operational affiliate" (The White House, Office of the Press Secretary, 2011).

As noted, and despite depictions like that of the President's claiming targeted killings are an effective policy, there has been little quantitative research conducted that affirms this sentiment. This is not surprising given the deficit of empirical quantitative work on counterterrorism as a whole (Lum, Kennedy, and Sherley, 2006). Instead, the focus of several studies has been on the legal or moral ramifications of using this tactic (Anderson, 2009; Radsan and Murphy, 2011). Other important work has been done to evaluate targeted killings but in different contexts that include, but are not limited to, Northern Ireland (Asal, Gill, Rethemeyer, and Horgan, 2015), the Israel–Palestine conflict (Benmelech, Berrebi, and Klor, 2015; Hafez and Hatfield, 2006; Zussman and Zussman, 2006), counterinsurgency in Egypt (Fielding and Shortland, 2010), and the role of leadership decapitation in group desistance (Johnston, 2012; Jordan, 2009; Mannes, 2008; Price, 2012). Although there has been some overlap in the latter category of work, only a few contributions have included a direct examination of the recent use of targeted killings by the United States through quantitative methodologies, which, have yielded mixed findings (Hepworth, 2014; Wilner, 2010).

Most of this prior research has been presented from a theoretical framework that fits within a familiar rational choice perspective. In this line of thinking, terrorists are presumed to be rational actors, which is a reasonable assumption given the amount of planning and cost–benefit calculation involved in attacks (LaFree and Ackerman, 2009). If the costs are presumed to be less attractive than the benefits, at least theoretically, the result should be fewer terrorist attacks. This analysis could be affected by several related mechanisms including specific and general deterrence, incapacitation, and a disruption of "routine activities."

Although some support has been consistent with a deterrent effect in the targeted killing literature (Price, 2012; Wilner, 2010), other researchers have concurrently posited that targeted killings should instead increase the perceived benefits of terrorism engagement (Hafez and Hatfield, 2006). Commonly referred to as a "backlash" effect and informed by the literatures on labeling and procedural justice theories (Becker, 1963; Lemert, 1951; Sherman, 1993; Tyler, 2000), this too has been found present within other counterterrorism investigations (Dugan and Chenoweth, 2012; LaFree, Dugan, and Korte, 2009). The death of terrorist leaders at the hands of the U.S. government is often met with public outrage (Radsan and Murphy, 2011), which in turn creates an invigorated "call to arms" of sorts by membership. For example, the statement released by al-Qa'ida officials after bin Laden's death prompted Pakistani Muslims to "rise up and revolt so they can cleanse this disgrace" (Simon, 2011: para. 8). Although a backlash effect has been hypothesized by some in

the targeted killing research, Hafez and Hatfield (2006) did not find it to be a factor in Palestinian violence. Nevertheless, other researchers have suggested it may operate through alternative mechanisms, like the increased recruitment of suicide bombers (David, 2003) or instead through complex insurgency–counterinsurgency relationships (Condra and Shapiro, 2012; Fielding and Shortland, 2010; Linke, Witmer, O’Loughlin, 2012).

Informed by a rational choice framework, a methodologically robust evaluation of the U.S. policy on targeted killings was conducted in this research, with a focus on high-profile actors. Specifically, both time-series analysis and series hazard modeling were used to test the influence of 10⁴ notable killings of al Qa’ida leaders in relation to several terrorism outcomes. Attacks perpetrated by the movement were obtained from the Global Terrorism Database (GTD), which employs a terrorism definition of “the threatened or actual use of illegal force and violence to attain a political, economic, religious, or social goal through fear, coercion, or intimidation” (LaFree and Dugan, 2007: 184). A series of hypotheses is posited in this study between the killings and both the frequency and hazard of subsequent terrorist attacks perpetrated by the global jihadist movement. As a whole, the U.S. targeted killing policy as it relates to these high-profile actors was found to be negligible.

Rational Choice Theory

Philosophers Beccaria and Bentham, with their discussions of utility and proportionality, laid the groundwork for the premise that sanctions should deter the rational, self-interested actor. Thus, crime should only occur when the potential rewards outweigh considerations of such punishments. This concept, the cost–benefit analysis of offender decision making, has become the crux of contemporary rational choice perspectives (Cornish and Clarke, 1986; Nagin and Paternoster, 1993).

One such perspective, that of deterrence theory, originally focused on objective measures of the certainty, severity, and celerity of legal sanctions (Chiricos and Waldo, 1970; Gibbs, 1968; Tittle, 1969; Tittle and Rowe, 1974). A number of policies have since been examined, including policing interventions (Sherman and Berk, 1984; Sherman and Weisburd, 1995), legislation (Kovandzic, Sloan, and Vieraitis, 2004), the death penalty (Cochran and Chamlin, 2000), and more recently, counterterrorism (Dugan, LaFree, and Piquero, 2005; LaFree et al., 2009; Pridemore and Freilich, 2007). Deterrence in this latter context, as operationalized by LaFree et al. (2009: 20) as “net *decreases* in the prevalence, incidence, or seriousness of future attacks,” has yielded inconsistent support, although only a handful of robust studies have been conducted (Lum et al, 2006). This includes certain efforts to decrease terrorist hijacking (Dugan et al., 2005), to combat terrorism in Northern Ireland

4. Although there have been several more targeted killings, this aim of this study was to narrow the sample to the most significant in the timeline. This approach allowed for the analyses also to control for all of the killings in one hazard model increasing internal validity, without the consequences associated with overfitting the model.

(LaFree et al., 2009), and those executed by Israeli state actors (Dugan and Chenoweth, 2012). In fact, evidence of the reverse outcome, that of backlash, was found in the latter studies.

The backlash effect, measured by LaFree et al. (2009: 20) as “net *increases* in the prevalence, incidence, or seriousness of future attacks,” occurs when the benefits of terrorism engagement outweigh its perceived costs. Labeling theories (Becker, 1963; Lemert, 1951) would argue that punishment further exacerbates terrorism by reinforcing the perpetrator’s identity as one of a terrorist. Alternatively, legitimacy (Sherman, 1993) and procedural justice theories (Tyler, 2000) maintain that perception of punishment is as important, if not more so, than the punishment itself. In other words, if a sanction is considered unfair, there is little chance that said sanction will deter future terrorism. In fact, Araj (2008; Brym and Araj, 2006) has suggested that terrorism is caused by these types of sanctions as groups rally behind perceived injustices.

As noted, backlash effects have been unearthed in a few notable counterterrorism investigations. LaFree and colleagues (2009) studied Northern Ireland and found that three of the six military interventions increased the hazard of a future terrorist attack. Dugan and Chenoweth (2012), as a result of their investigation of conciliatory and repressive actions by the Israeli government, ascertained that the latter had resulted in an increase in Palestinian terrorism. A complex relationship between counterinsurgency and political violence, with some measures leading to unintended outcomes, has been found as a result of other work (Condra and Shapiro, 2012; Fielding and Shortland, 2010; Linke et al., 2012).

Informed by this line of research, then, it would be fair to hypothesize that targeted killings are more likely to yield a backlash effect than a deterrent effect, particularly given the policy’s perceived legitimacy as a sanction. Nevertheless, the next section reviews what is known about targeted killings and leadership decapitation in general, which does garner some nuanced and contextual support for deterrent effects.

Targeted Killings as Counterterrorism

Most studies designed to focus on targeted killings primarily have resulted in a discussion of the legal and ethical implications of using this immensely controversial counterterrorism tactic (Anderson, 2009; Radsan and Murphy, 2011). This controversy, as summarized by Zussman and Zussman (2006), falls into three main categories of objections. The first set of such objections is legal and primarily focuses on the extrajudicial nature of the policy. David (2003) noted that, in accordance with Israeli law, so long as three criteria are met, the use of assassinations does violate international law. The issue then becomes whether such policies are in fact assassinations given they do not target political figures but instead terrorists. The second category of objections, the moral argument against this tactic, is focused on the collateral damage that such killings are bound to have on civilians (Radsan and Murphy, 2011). In addition, the U.S. definition of “terrorist-related” has been condemned for its vagueness, allowing those in proximity to terrorists to be considered terrorists themselves

(Alston, 2010). As Radsan and Murphy (2011) argued, certainty in target selection must involve an external review that is consistent with the standard of proof in criminal and civil court: “beyond a reasonable doubt” or “clear and convincing,” respectively. Other scholars have maintained that no policy in a time of war is truly morally justified and that targeted killing, given its proportionate and discriminatory nature, is the lesser of evils (David, 2003). Finally, opponents have contended that targeted killings will have the aforementioned backlash effect that would supersede any disruption to organizational competence.

A more limited pool of the targeted killing literature includes evaluations of its effectiveness on a variety of outcomes, yielding mixed results (Hafez and Hatfield, 2006; Hepworth, 2014; Price, 2012; Wilner, 2010; Zussman and Zussman, 2006). The use of targeted killings within the Israeli–Palestine conflict has been examined in much of this research (Benmelech et al., 2015; Hafez and Hatfield, 2006; Kaplan, Mintz, Mishal, and Samban, 2005; Zussman and Zussman, 2006). For example, Hafez and Hatfield (2006) assessed Israeli targeted killings on rates of Palestinian violence from September 2000 to June 2004 during the *Al-Aqsa* uprising. The authors found that targeted killings yielded a null effect on both long-term and short-term violence perpetrated by Palestinians. They posited that target hardening strategies like security checkpoints and the separation wall may have been responsible for the decrease in Palestinian violence rather than the actual killings. Also within this context is the contribution of Zussman and Zussman (2006), who maintained that terrorism is a form of “economic warfare.” The authors investigated the role of 159 Israeli assassination attempts on stock market trends from September 2000 to April 2004. Defining target seniority through three criteria and an expert ranking, these researchers determined that the stock market (both Israeli and Palestinian) did decline after the deaths of senior political leaders. The opposite was true of military leaders; in other words, the Israeli stock market reacted positively to these types of targeted killings. Zussman and Zussman (2006) concluded that their findings are indicative of market perceptions and that the targeted killings of political leaders are viewed as counterproductive, whereas the deaths of military leaders are seen as an effective counterterrorism strategy. Other researchers have reaffirmed this importance of target selection, particularly if the killing also involves civilian casualties. Benmelech et al. (2015) contended that house demolitions were an effective countermeasure if the target was justified not merely by location but also by the individual. Although examining the Northern Ireland conflict, Asal and colleagues (2015) found some effects in line with deterrence but also determined that indiscriminate violence had the opposite influence on total, civilian, and shooting fatalities.

Targeted killings within other Middle Eastern contexts have also been evaluated (Hepworth, 2014; Neumann, Evans, and Pantucci, 2011; Wilner, 2010). Wilner (2010), in a study of Taliban leaders in Afghanistan, maintained that if the policy is selective, it has the power to “degrade an organization’s overall capability to plan, coordinate and carry out acts of violence” (p. 312). Thus, overall violence increased after the targeted killings

of Taliban leaders in Afghanistan, but the use of more sophisticated tactics, like that of suicide bombing, decreased by more than 30%. This finding was exacerbated by the related increase in bombing failure rates. Wilner (2010) concluded that a larger shift in operational abilities among the Taliban occurred at this time, which led the organization to participate in more frequent, but less sophisticated, types of terrorism. Hepworth's (2014) study, the most similar in scope to the current work, yielded few significant changes in the type of attacks perpetrated by al Qaeda groups after the deaths of four important leaders save a small decrease in average fatalities. He concluded that groups may have already been "maxed out" on motivation, and thus, the death of one more leader would not have caused any more backlash than what was already present.

Finally, targeted killing from the standpoint of leadership decapitation has been approached in a related line of research (Johnston, 2012; Jordan, 2009; Mannes, 2008; Price, 2012). For instance, Price (2012) examined the rate of mortality among 207 terrorist groups from 1970 through 2008. Although acknowledging the backlash literature, Price (2012) argued that leadership removal should be effective at motivating organizational desistance given the nature of such organizations, namely, that they are secretive, violent, and ideologically motivated. Such characteristics make terrorist groups susceptible to decapitation, Price (2012) maintained, because they also make the role of the leader that much more important and succession that much more difficult. By employing hazard modeling on an original dataset, the author found that leadership decapitation, regardless of the method, did in fact lead to terrorist group desistance. Unable to examine the role of bin Laden's assassination on al Qaeda given the recency of such events, Price (2012) concluded that it would "most likely increase the group's chances of organizational death, but not nearly at the rate it would had it occurred during the group's early years" (p. 45).

As a whole, in the literature on targeted killings, an unresolved debate behind the legal and ethical issues inherent to the policy has been produced, with qualified findings regarding its effectiveness. It would seem that the type of target affects the success of the policy (Zussman and Zussman, 2006), along with whether the violence is perceived as indiscriminate (Asal et al., 2015; Benmelech et al., 2013). In addition, even though overall violence may increase, the sophistication of that violence may be diminished (Wilner, 2010), along with a group's long-term capabilities (Price, 2012). Interestingly, several high-profile targeted killings remain untested in relation to terrorism perpetrated by the global jihadist movement.

Current Study

The review of the extant literature has demonstrated a few important gaps in the literature and perhaps, more importantly, between existing policy and its assessment. First and foremost, although the use of targeted killings by the United States has garnered immense criticism within the literature, it has had limited direct quantitative evaluation as a counterterrorism tool (Hepworth, 2014; Wilner, 2010). Studies examining similar policies in

different contexts have yielded mixed results, which suggests that targeted killings can reduce the sophistication of terrorist tactics, lead to entire group desistance, or instead cause an increase in terrorist violence if the target is viewed as illegitimate. This gap in the literature is especially noteworthy given that the results of eliminating some of the most high-profile targets in the “war on terror” are almost unknown. The global jihadist movement is currently the most active and deadly in the world (Brantiff, 2014; LaFree and Dugan, 2015), making countermeasures aimed at combating this threat that much more important to evaluate.

Second, and relatedly, given that both deterrent and backlash effects have been found in the targeted killing and larger counterterrorism literatures, it is vital to explore the framework of both in relation to this policy.⁵ Therefore, and informed by a rational choice perspective, the first step in this research was to examine all terrorism perpetrated by the global jihadist movement in relation to the killings of interest. Even though the deaths of leaders may have differential effects on segments of the movement, as assessed in this article, it is imperative first to determine whether there has been an influence on the larger threat. Although the relationship between groups within the movement is dynamic, I began with the full scope of the phenomenon given the objective of these killings is not necessarily al Qa’ida specific. Specifically, it was posited that:

Hypothesis 1: The frequency of total terrorism perpetrated by the global jihadist movement will either *increase* or *decrease* after the killings of high-profile al Qa’ida leaders.

In line with prior work (Canetti-Nisim, Mesch, and Pedahzur, 2006; Hepworth, 2014; Wilner, 2010), the design of this study was in agreement that the success (or lack thereof) of counterterrorism cannot be measured solely through a decrease in the frequency in total incidents. Rather, the complexity of these incidents should be taken into consideration. Therefore, the role of the aforementioned killings on the frequency and hazard of incidents involving fatalities and categorized as suicide attacks was examined in this research. It is also important, particularly given recent work on displacement effects (Carson, 2014; Hsu and Apel, 2015; Lum et al., 2006), that terrorism outcomes are disaggregated. In other words, although total terrorism could be affected by a policy, this effect becomes moot if it that same policy increases more problematic outcomes. The secondary hypotheses, thus, became:

Hypothesis 2a: The frequency and hazard of incidents both involving fatalities and perpetrated by the global jihadist movement will *increase* or *decrease* after the killings of high-profile al Qa’ida leaders.

Hypothesis 2b: The frequency and hazard of suicide attacks perpetrated by the global jihadist movement will *increase* or *decrease* after the killings of high-profile al Qa’ida leaders.

5. A two-tailed hypothesis would be falsifiable if a lack of significance in either direction is found.

Also, just those incidents solely perpetrated by the al Qa'ida core were reviewed in this research as these should be differentially affected given the targets examined. Furthermore, country-specific effects were also examined. In other words, deterrent or backlash effects are more probable within the country in which the killing occurred. Again, and inspired by a two-tailed rational choice framework, the following was posited while conducting this study:

Hypothesis 3a: The hazard of incidents perpetrated by al Qa'ida central will *increase* or *decrease* after the high-profile killings of al Qa'ida leaders.

Hypothesis 3b: The frequency and hazard of incidents perpetrated by the global jihadist movement will *increase* or *decrease* in the country in which the high-profile killing occurred.

Finally, and inspired by Zussman and Zussman's (2010) research on the influence of military versus political leaders and based on their definition,⁶ it was predicted during this investigation that the effect would be contingent on target type. Specifically, the death of military leaders would be more likely to lead to a deterrent effect, whereas the death of political leaders would cause backlash effects. In addition, and based on the work of Benmelech et al. (2015) and Asal et al. (2015), it was predicted during this study that if an attack involved civilian casualties, it would produce results consistent with the former rather than with the latter:

Hypothesis 4a: *Deterrent effects* will be more likely after the deaths of military leaders, whereas *backlash effects* will be more likely after the deaths of political leaders.

Hypothesis 4b: Targeted killings involving civilian casualties will be more likely to yield *backlash effects*.

In summary, 10 high-profile killings vital to the U.S. counterterrorism timeline in relation to total, lethal, suicide attacks perpetrated by the global jihadist movement and those specifically by al Qa'ida groups were investigated as part of this research. Motivated by a rational choice perspective, it was expected that these killings would either increase or decrease the frequency and hazard of all outcomes and have differential effects based on country, type of leader, and whether civilian casualties were involved.

Data

Global Terrorism Database. The GTD, although certainly not without limitations, is the most comprehensive and inclusive database of terrorism incidents currently in existence.

6. As defined by Zussman and Zussman (2010: 4), "military leaders are involved in planning operations, and recruiting, training, arming, and dispatching terrorists. Senior political leaders, in contrast, are primarily responsible for political and spiritual guidance."

The download of the GTD⁷ during this investigation included data through 2013, with more than 125,000 incidents as ascertained from open-source material such as newspapers, wire services, and government reports. The GTD was especially relevant for this particular study because of its incorporation of both international and domestic terrorist attacks, which is especially significant given that the former outweighs the latter by considerable margins.

The GTD relies on the previously identified definition of terrorism: “the threatened or actual use of illegal force and violence to attain a political, economic, religious or social goal through fear, coercion or intimidation” (LaFree and Dugan, 2007: 184). Nevertheless, these data also use a criterion system with three mandatory characteristics (intentionality, subnational perpetrators, and the threat of/violence) and two of the following three: (1) a political, economic, religious, or social goal; (2) an objective to coerce, intimidate, or convey a message to a larger audience; or (3) an action outside of international humanitarian law (National Consortium for the Study of Terrorism and Responses to Terrorism, 2013). The current study comprised cases that met at least two of these three criteria.

Although the GTD has undergone multiple phases of data collection from different sources, researchers have also engaged in a systematic and robust synthesis of these data. This synthesis, covering the years 1970–2014, focused on definitions, methodology, and perhaps most vital, missing cases. Such efforts allow for increased confidence regarding time-series investigations.

Center for the Study of Targeted Killing Database. To discern which of the numerous targeted killings were likely to be most influential to the counterterrorism timeline, the database compiled by the Center for the Study of Targeted Killing (CSTK) at the University of Massachusetts—Dartmouth was primarily relied on for this study. Given the ambiguity involved in the reporting of these incidents, the staff at CSTK uses multiple reputable news sources and invokes an ordering criterion for determining which one is deemed to be the primary.

The data are searchable by “attacking country” and whether the incident involved a “high value target,” which was used in this investigation to condense the sample. For the former, the search returned 519 targeted killings committed by the United States from 2002 (the first year documented) to 2013. In the case of the latter, the sample was then narrowed to a total of 98 incidents from 2002 to 2013 that involved this classification of at least one “high value target.” Next, the sample was further condensed to exclude those where there was any uncertainty surrounding the death of a target,⁸ U.S. involvement in that death,

7. Downloaded January 2015.

8. This would preclude, for example, the suggestions of one reviewer to include Ilyas Kashmiri and Mohamed Atef al Masri, who although important to the al' Qa'ida leadership, had multiple dates reported for their deaths. This same reviewer also suggested examining Saeed al-Masri, who also had some ambiguity around his death. Nevertheless, I ran models with the “confirmed” date of May 21, 2010 and discovered a significant increase in fatal, suicide, and the hazard of al Qa'ida attacks, along with a decrease in the hazard of Pakistan incidents.

TABLE 1

Targeted Killings of Interest

Date	Primary Target	Type of Target	Country of Killing	Number of Suspected Militants Killed	Number of Civilians Killed
11/03/2002	al-Harethi	Political	Yemen	6	0
11/30/2005	Rabia	Political	Pakistan	3	1
04/12/2006	Atwah	Military	Pakistan	7	2
06/08/2006	al-Zarqawi	Political/Military	Iraq	6	1
10/16/2008	Habib	Military	Pakistan	2	0
05/02/2011	bin Laden	Political	Pakistan	6	0
08/22/2011	al-Rahman	Military	Pakistan	4	0
09/30/2011	al-Awlaki	Political	Yemen	2	0
04/22/2012	al-Umda	Political/Military	Yemen	4	0
06/04/2012	al-Libi	Political/Military	Pakistan	1	0

or whether the target was truly “high value.” From the remaining incidents, eight killings were then chosen because (a) of the target’s identification in the primary source as a top al Qa’ida leader; (b) of the target’s affiliation with a high-profile attack or attacks, such as the *USS Cole* bombing; and (3) because it allowed for variation in the dependent variables. Two additional killings, that of al-Zarqawi and that of bin Laden, were added to the sample given their obvious significance to the al Qa’ida leadership.⁹ Table 1 lists the incidents by date, target name, target type (military or political), country of the killing, and the number of suspected militants and civilians killed in the attack. As demonstrated, certain leaders engaged in roles that were at times considered political and at other times, military.¹⁰

Sample

From the GTD, a sample was created for this study of 9,436 incidents that were perpetrated by the global jihadist movement from 1994 to 2013 (240 months). McCauley and Moskalenko’s (2014) definition of a “global jihadist movement” was relied on for this investigation. It includes the following four main criteria:

- (1) Islam is under attack by Western crusaders led by the United States
- (2) Jihadis, whom the West refers to as ‘terrorists,’ are defending against this attack
- (3) The actions they take in defence of Islam are proportional, just, and religiously sanctified and therefore,
- (4) It is the duty of good Muslims to support these actions. (p. 70)

9. These incidents are not included in the CSTK given the data primarily focus on drone strikes.

10. For example, al-Zarqawi started as a military leader in the Afghanistan–Soviet war and became much more of a political figure before his death.

Based on these criteria, groups that shared this ideology were next identified by using four main sources. First, Terrorist Organization Profiles (TOPS) data were analyzed for an initial list. TOPS data were a multifaceted effort involving the Department of Justice, the Department of Homeland Security, the Memorial Institute for the Prevention of Terrorism, and Dedica. Given that TOPS was last updated in March 2008, more recent sources were used to supplement, including the testimony of William Brantiff, Executive Director of the National Consortium for the Study of Terrorism and Responses to Terrorism, before the House Armed Services Committee. Brantiff's testimony pinpointed the most lethal groups associated with violent Islamic extremist movements in 2012. In addition, lists compiled by the Mapping Militant Organizations research project at Stanford University and by the Taliban/al Qa'ida Sanctions United Nations Committee were examined. In total, more than 144 groups were checked for inclusion in the GTD, of which 74 groups perpetrated an attack during the aforementioned timeframe (see Appendix A for a final group list, with those included in the al Qa'ida group analyses as starred¹¹).

Method

As noted, two types of outcomes were employed in relation to the targeted killings of interest: frequency of incidents and time between attacks. The former involved an interrupted time-series design (autoregressive moving average with exogenous inputs or ARIMAX with the control variables), which measures the effect of an intervention by addressing the temporally dependent "noise" inherent to these types of data (McDowall, 1980). Essentially, this method indicates whether the time series is altered after an intervention is introduced, in this case, the targeted killing. Sensitive to the criticism of time-series analysis (Charles and Durlauf, 2013; Dugan, 2011), analyses with different levels of aggregation and with lagged intervention dates were conducted. Perhaps even more importantly, analyses were run on the latter set of outcomes by using series hazard models, a recently developed methodology that seeks to address many of the issues intrinsic to time-series models.

Series hazard models have become increasingly popular in evaluating the effect of macro-level changes like those of counterterrorism efforts on incident-level data (see Dugan, 2011, for a full description of this method). Previously used to evaluate measures against aerial hijackings (Dugan et al., 2005), terrorism in Northern Ireland (LaFree et al., 2009), and eco-terrorism (Carson, 2014), this method estimates the change in an incident's hazard rate based on event- and date-specific variables. Given the frequency of incidents perpetrated by the global jihadist movement, analyses could only be conducted on more limited dependent variables. In other words, the total sample of 9,436 could not be assessed via a hazard model

11. This list may be an oversimplification of groups considered to be the core of al Qa'ida, especially given the dynamic nature of relationships between organizations and disagreement regarding the role of AQAP, AQIM, and AQI in particular. Nevertheless, the GTD's reliance on news sources may also limit accuracy surrounding the identification of which specific al Qa'ida entity is responsible for an attack. Thus, limiting this outcome solely to "al Qa'ida" suffers from its own set of issues.

TABLE 2

Descriptive Statistics of ARIMAX Models

Variable	<i>N</i>	Mean	SD
Log Total Attacks	240	3.764	1.410
Fatal Attacks	240	27.483	40.911
Suicide Attacks	240	4.521	6.880
Defense Spending	240	0.176	.015
Number of Troops	240	22,889.87	20,289.89
Number of Killings	240	2.171	4.324

Note. SD = standard deviation.

as the time between incidents was meaningless (there are only 7,300 days in the entire series). Nevertheless, and for rarer occurrences like that of highly lethal and suicide attacks, the series hazard model provided for effects indistinguishable in the ARIMAX models.

Tables 2 and 3 demonstrate the descriptive statistics for the variables as described in the next sections.

Dependent Variables

Table 2 shows the descriptive statistics of the dependent variables included in the ARIMAX models. As indicated, the series covers a range of January 1994 to December 2013 totaling 240 total months. The monthly average of logged¹² total attacks was nearly 4.0, around 27.0 for fatal attacks (incidents where the number killed was at least one) and 4.5 for suicide attacks.¹³

The effect of targeted killings on terrorist incidents perpetrated solely by al Qa'ida central¹⁴ (designated by an asterisk in Appendix A), those that involve 10 or more fatalities, and those operationalized as a suicide attack is also explored. Thus, and as demonstrated in Table 3, the dependent variables become days until next al Qa'ida attack (5.821), days until next highly lethal attack (8.479), and days until next suicide attack (8.027). To address issues with tied data, the exact marginal method is used (see Dugan [2011] for a full discussion).

12. Given that total attacks were a highly skewed outcome, the natural log was used for this variable (after adding 1 to avoid taking the nonexistent log of 0). This procedure normalized the data for this particular variable.
13. As defined in the GTD codebook as "coded 'yes' in those cases where there is evidence that the perpetrator did not intend to escape from the attack alive" (p. 26).
14. It should be noted that this estimate does differ from other recent estimates of al Qa'ida-related attacks, primarily based on discrepancies in operationalization. For example, LaFree and Dugan (2015) examined attacks just tied to "al Qa'ida" (and not to the other entities included in this study) during a shorter time period. Thus, their estimate of 69 incidents was considerably smaller.

T A B L E 3

Means and Standard Deviations for Series Hazard Models

Incident	al Qa'ida Core (n = 1,388)	Highly Lethal Attacks (n = 1,033)	Suicide Attacks (n = 1,085)
Next Incident	5.821 (24.744)	8.479 (17.751)	8.027 (40.668)
al-Harethi	.987 (.113)	.903 (.296)	.976 (.153)
Rabia	.0907 (.290)	.797 (.403)	.876 (.329)
Atwah	.899 (.301)	.799 (.408)	.867 (.339)
al-Zarqawi	.898 (.302)	.787 (.410)	.861 (.346)
Habib	.748 (.434)	.677 (.468)	.737 (.440)
bin Laden	.605 (.488)	.494 (.500)	.548 (.498)
al-Rahman	.580 (.494)	.469 (.499)	.514 (.500)
al-Awlaki	.565 (.496)	.457 (.498)	.504 (.500)
al-Umda	.406 (.491)	.375 (.484)	.401 (.490)
al-Libi	.380 (.486)	.350 (.477)	.376 (.485)
Last Attempt	6.211 (25.389)	8.289 (16.855)	8.506 (48.691)
Success Density	.936 (.095)	.985 (.044)	.915 (.111)
Monthly Count	201.821 (33.730)	187.763 (52.154)	198.789 (38.385)
Defense Spending	.185 (.007)	.182 (.010)	.184 (.008)
Number of Troops	39903.27 (8375.681)	36084.33 (12317.720)	38856.33 (8334.415)
Number of Killings	6.543 (5.764)	5.121 (5.126)	5.802 (5.410)

Furthermore, incidents that occurred on the same day were recoded to ensure the dependent variable reflected the actual days until the next attack.¹⁵

Targeted Killings. As noted, the 10 targeted killings are my primary independent variables, where 1 indicates the months (time series) or dates (series hazard) after the deaths of

15. Without this procedure, the second event on a particular day would reflect 0.

al-Harethi (November 3, 2002), bin Laden (May 2, 2011), Rabia (November 30, 2005), Atwah (April 12, 2006), al-Zarqawi (June 8, 2006), Habib (October 16, 2008), al-Rahman (August 22, 2011), al-Awlaki (September 30, 2011), al-Umda (April 22, 2012), and al-Libi (June 4, 2012). As noted, the time-series models included a lagged start date (by 1 month) to avoid simultaneity bias. It is certainly possible that the targeted killings of interest were enacted in response to already high levels of terrorism, where any decrease in activity would be representative of a natural decline rather than of the policy itself.

For the series hazard models, the independent variables were set equal to 1 until the end of the series (similar to Dugan and Yang's [2012] example of the Guzman arrest). The means of the primary independent variables for the series hazard models, as shown in Table 3, are the percentage of incidents that occur after the targeted killings of interest. For example, 60% of al Qaeda attacks transpired after bin Laden's death.

Controls. This study also included control variables that will help to parse out competing trends.¹⁶ Both analyses incorporated a variable that operationalizes yearly defense spending. This control will help to determine whether it is that more funds are spent on counterterrorism efforts rather than on the policy itself that influences additional incidents. This variable is measured through a percentage of the U.S. budget, as ascertained from the White House's Office of Management and Budget, that is spent on military expenditures versus total agency outlays. In addition, all models have a monthly control for number of U.S. troops involved in both the Afghan and Iraq wars, taken from the Congressional Research Service (Belasco, 2009).¹⁷ Finally, a variable for the number of monthly drone strikes perpetrated by the United States, again as determined by the CSTK database, was included. This control will assist with separating out the effect of killing the leader of interest from other killings.

The series hazard models also include a monthly count variable to ensure any effects are not the result of an unrelated trend in the hazard of incidents. Based on prior research (Dugan, 2011; Dugan and Yang, 2012; LaFree et al., 2009), interactions with the monthly count also were tested in this study to see whether the slope of each intervention differs from this overall trend. As Dugan and Yang (2012) noted, it may be naive to assume a constant effect that lasts until the end of the series even in similar cases like that of a leader's arrest. Nine of the ten targeted killings yielded interaction effects that garnered significance and, thus, indicated a better fit in the various models.

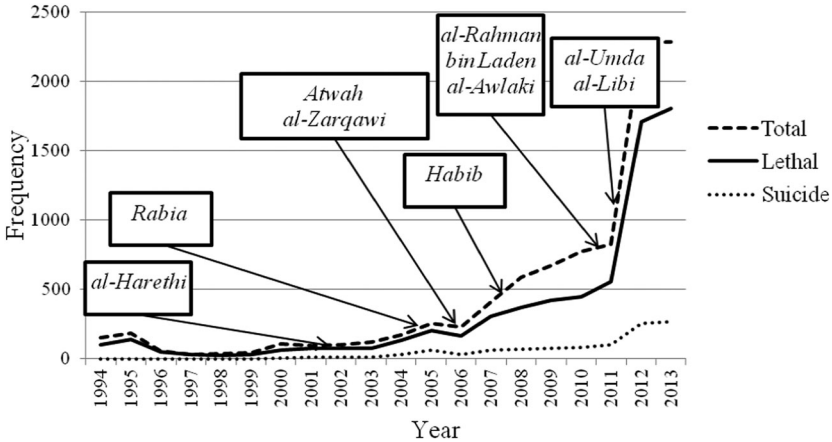
The series hazard models, based on previous studies that included this method, were integrated with date-specific controls, namely, last incident attempt (number of days since the last incident) and success density (proportion of current and six previous incidents that

16. Given that this is a global-level investigation over time, the amount of controls available was limited in comparison with the recent country or county-level contributions.

17. These data only include monthly estimates through November 2008, so the average for the total time series was imputed until the end of the series.

FIGURE 1

Total, Lethal, and Suicide Attacks Perpetrated by the Global Jihadist Movement, 1994-2013



were successful). It is possible that successful events that occur close together could decrease or increase the hazard of future attacks perpetrated by the global jihadist movement. In other words, this can help to discern whether it is the policy rather than just a series of successful incidents that causes a change in the hazard.

Results

Descriptive Trends

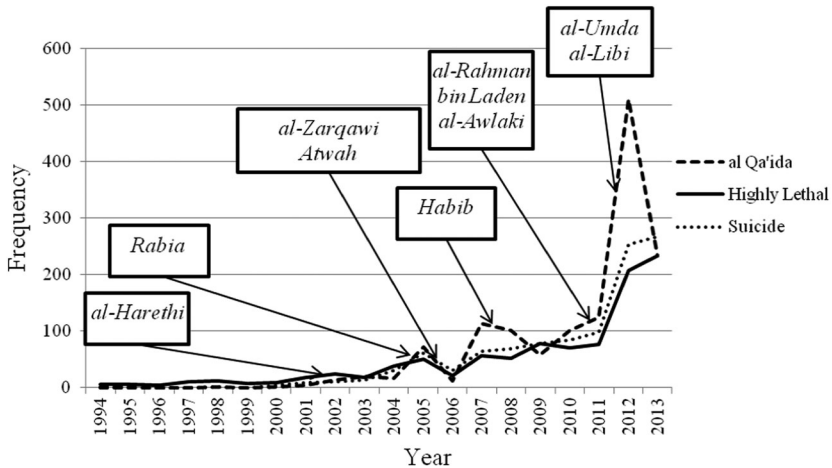
Figures 1 and 2 demonstrate the yearly trends of terrorist attacks perpetrated by the global jihadist movement from 1994 to 2013. As shown in Figure 1, the amount of total and lethal terrorism witnessed a steady increase until the end of the series, with a similar, albeit less pronounced, progression in suicide attacks. These increases seem to be especially elevated after the deaths of bin Laden, al-Rahman, and al-Awlaki. In fact, from 2011 to 2012, there was a 175% increase in total incidents, a 209% increase in lethal incidents, and a 156% increase in suicide attacks. These findings hold for al-Qa'ida and highly lethal incidents as exhibited in Figure 2, which yielded 311% and 206% increases, respectively, during the same time period.¹⁸

Nevertheless, and after al-Hareithi's killing, there was considerably less change in terrorism outcomes. From 2002 to 2003, total incidents did increase by 14%, as did al-Qa'ida and

18. These substantial increases occur during the same time period when the GTD underwent a change in data collection processes. Although the previously described efforts at synthesizing these data have minimized issues with consistency over time, there could be some lingering issues with instrumentation.

FIGURE 2

al Qa'ida, Highly Lethal, and Suicide Attacks, 1994-2013



suicide attacks, but such changes were much more negligible. Notably, highly fatal attacks were the only outcome that showed a decrease in any model: from 25 to 18 incidents, respectively.

Interestingly, some of the largest increases occurred from 2006 to 2007, the year after Atwah's and al-Zarqawi's deaths.¹⁹ Specifically, there was a 78% increase in total terrorism, an 82% increase in lethal incidents, and a 110% increase in suicide attacks. When the outcome is limited to those incidents involving 10 or more deaths, the increase becomes 166%; it is an astonishing 850% when examining those attacks solely perpetrated by al Qa'ida central. As a whole, these descriptive patterns are consistent with that of the backlash perspective. Yet, more robust analyses will help to parse out whether these increases are associated with, or merely spurious of, the targeted killings of interest.

Time-Series Results

For the time-series analysis, noise models were first identified for each of the three series as designated in Table 4. Sources of dependency can include a trend in the data (i.e., a steady increase or decrease over the entire series) and seasonality (i.e., an increase in terrorism during certain religious periods like that of Ramadan). In addition, adjacent errors may be correlated in time-sensitive data, where each observation could be related to the previous

19. This spike may also be representative of the rise in insurgencies in Iraq, particularly during the Sunni Awakening.

T A B L E 4

ARIMAX Model Specification

Attacks	Noise Model	Coefficient of Intervention	SE	z	p
Total Attacks	ARIMA(1,0,1)				
al-Harethi		.017	.054	.31	.754
Rabia		-.004	.048	-.10	.922
Atwah		.014	.051	.28	.783
al-Zarqawi		.023	.052	.52	.604
Habib		.120	.147	.82	.412
bin Laden		.155	.111	1.40	.163
al-Rahman		.187	.128	1.47	.143
al-Awlaki		.199	.137	1.45	.146
al-Umda		.092	.133	.70	.485
al-Libi		.087	.146	.60	.550
Fatal Attacks	ARIMA(2,0,0)				
al-Harethi		2.262	6.089	.37	.710
Rabia		1.734	3.450	.50	.615
Atwah		2.157	3.284	.66	.511
al-Zarqawi		2.278	2.943	.77	.439
Habib		4.882	2.333	2.09	.036*
bin Laden		17.087	2.338	7.31	.000***
al-Rahman		27.366	2.562	10.68	.000***
al-Awlaki		39.833	3.867	10.30	.000***
al-Umda		-2.185	2.507	-.87	.383
al-Libi		-2.896	2.213	-1.31	.191
Suicide Attacks	ARIMA(1,0,1)				
al-Harethi		.420	.631	.67	.506
Rabia		.083	.377	.22	.825
Atwah		.310	.365	.85	.396
al-Zarqawi		.343	.375	.91	.361
Habib		1.082	.436	2.48	.013*
bin Laden		1.415	.167	8.48	.000***
al-Rahman		2.024	.237	8.53	.000***
al-Awlaki		5.478	.746	7.34	.000***
al-Umda		-1.201	.588	-2.04	.041*
al-Libi		-1.028	.621	-1.65	.098

Note: SE = standard error.

* $p < .05$. *** $p < .001$.

observation. Thus, it is necessary to establish a stationary trend before conducting any analysis (McDowall, 1980).

After the noise components were identified, the effect of the targeted killings through the previously described dummy variables was examined. In other words, an intervention component is added to the already specified noise models. Then, as a result of this addition, three distinct effects can now be tested: abrupt and temporary, gradual and permanent,

and abrupt and permanent. It is certainly plausible that the targeted killings of interest resulted in any of these outcomes. For example, the killings could have decreased terrorism immediately after the leader was killed given the initial setback to operational capabilities, but then the effect is short-lived as the replacement takes over. Following the suggestions of McDowall (1980), the interventions were first modeled with this type of abrupt, temporary change (3-month effects). None of the series indicated this type of result as ascertained from their slope coefficients. Gradual, permanent effects were then tested, which were present in all models. Thus, it seems that if the killings affected terrorism, it was not immediate but rather took some time and then caused outcomes that were present until the end of the series.

Table 4 also shows the results of all three time series. For ease of reporting, only the coefficient of the intervention is displayed, although all models had controls for defense spending, number of troops, and number of targeted killings. There are nine significant effects throughout all the models. Interestingly, al-Harethi's, Rabia's, Atwah's, al-Zarqawi's, and al-Libi's killings did not have a significant influence on any outcome. The deaths of Habib, bin Laden, al-Rahman and al-Awlaki, on the other hand, increased the frequency of both fatal and suicide attacks. Specifically, Habib's death led to 5 more fatal and 1 additional suicide attack per month; these numbers were 27 and 2 for al-Rahman. In addition, bin Laden's killing increased fatal attacks by 17 per month and suicide attacks by more than 1 per month, whereas al-Awlaki's death increased these same outcomes by 39 and 5, respectively. These findings are interesting given that their killings did not affect total attacks but the more undesirable types of incidents, namely, those that caused lethality or involved a suicidal perpetrator. The one exception was al-Umda, whose death did not significantly affect total or lethal terrorism but did decrease suicide attacks by 1 per month.

Given that many of these effects occurred around the 9/11 anniversary, a series of sensitivity analyses were next conducted on the fatal and suicide outcomes (see Appendix B for results). For both of these dependent variables, a dummy variable was added to the model (where 1 = after September 11, 2011). As a result, a gradual, permanent effect as ascertained from McDowall's (1980) aforementioned procedure was indicated in this control. After the anniversary variable was included, none of the remaining variables retained significance in the fatal series. In addition, bin Laden's killing no longer had a significant relationship with suicide attacks. It seems as if some of these backlash effects can be explained by the anniversary of bin Laden's death as much as by the targeted killings.

Series Hazard Results

The series hazard model results as exhibited in Table 5 yielded significant effects²⁰ that were somewhat consistent with that of the time-series analyses. Once again, Rabia's, Atwah's, and al-Zarqawi's killings did not significantly alter terrorist outcomes as they pertain to the

20. Sensitivity analyses were also run on the hazard models that included a variable for the 9/11 anniversary, but these did not yield discernible effects.

TABLE 5

Coefficients and Standard Errors for Series Hazard Models

Incident	al Qa'ida Core (n = 1,388)	Highly Lethal Attacks (n = 1,033)	Suicide Attacks (n = 1,085)	Yemen Attacks (n = 480)
al-Harethi	−8.151 (9.296)	−.832* (.354)	−.460 (.465)	—
al-Harethi <i>interaction</i>	.075 (.092)	—	—	—
Rabia	24.098 (34.719)	−39.107 (41.333)	−20.216 (38.185)	—
Rabia <i>interaction</i>	−.171 (.239)	.260 (.283)	.130 (.261)	—
Atwah	−24.017 (34.684)	132.449 (187.149)	50.711 (91.421)	—
Atwah <i>interaction</i>	.169 (.238)	−.895 (1.260)	−.343 (.615)	—
al-Zarqawi	−.388 (1.023)	−92.930 (182.430)	−23.390 (0.778)	—
al-Zarqawi <i>interaction</i>	—	.627 (1.227)	.159 (.556)	—
Habib	−.592 (.385)	2.188 (3.090)	.274 (.429)	—
Habib <i>interaction</i>	—	.009 (.018)	—	—
bin Laden	.040 (.261)	−.742 (44.011)	83.676 (41.697)	—
bin Laden <i>interaction</i>	—	.004 (.209)	−.396* (.198)	—
al Rahman	81.611 (112.760)	37.090 (138.705)	−92.629* (41.704)	—
al Rahman <i>interaction</i>	−.381 (.531)	−.173 (.653)	.439* (.198)	—
al-Awlaki	−161.691 (113.689)	−37.370 (131.262)	.360 (.367)	−68.462*** (15.364)
al-Awlaki <i>interaction</i>	.752 (.534)	.176 (.617)	—	.318*** (.071)
al-Umda	−1.368*** (.356)	.956*** (.261)	−.713* (.354)	79.393*** (15.918)
al-Umda <i>interaction</i>	—	—	—	−.365*** (.073)
al-Libi	95.034*** (15.017)	−.413 (.252)	.337 (.355)	—
al-Libi <i>interaction</i>	−.429*** (.068)	—	—	—
Last Attempt	−.006* (.003)	.004 (.003)	−.001 (.004)	−.004 (.003)

(Continued)

TABLE 5

Continued				
Incident	al Qa'ida Core (n = 1,388)	Highly Lethal Attacks (n = 1,033)	Suicide Attacks (n = 1,085)	Yemen Attacks (n = 480)
Success Density	-.001 (.000)	-.939 (.753)	.763* (.369)	.338 (.465)
Monthly Count	-.052 (.092)	.021*** (.005)	.060*** (.013)	-.044** (.015)
Defense Spending	20.556 [†] (11.419)	.809 (9.911)	-13.185 (12.092)	-15.491 (22.761)
Number of Troops	.000 (.000)	.000* (.000)	.000 (.000)	.000 (.000)
Number of Killings	-.015 (.011)	-.010 (.010)	.025** (.010)	.048*** (.010)

* $p < .05$. ** $p < .01$. *** $p < .001$.

time between attacks perpetrated by al Qa'ida, those considered highly lethal, and those categorized as suicide. Also consistent with the time-series analysis are the findings regarding al-Rahman. Here his death resulted in a significant decrease in the hazard of suicide attacks.

Two primary mismatches are found between the analyses. In the hazard models, bin Laden's killing decreased subsequent suicide attacks, when it was found to increase the frequency of both these and fatal attacks in the time-series analysis. Nonetheless, as noted, the time-series effects were sensitive to the 9/11 anniversary. The other major deviation was that of al-Umda, whose killing significantly increased the hazard of highly lethal attacks but had decreased the frequency of suicide attacks. Significant effects were also found in the hazard models that were not discovered in the time-series analysis; namely, al-Harethi's death significantly decreased the hazard of highly lethal attacks, and al-Libi's killing influenced al Qa'ida attacks. In addition, Habib and al-Awlaki, found to alter the frequency of incidents, did not affect the hazard of the primary dependent variables.

Discussion

This investigation's findings, as summarized in Table 6, demonstrate that the 10 targeted killings of al Qa'ida leaders led to mostly negligible effects on terrorism. None of these killings significantly affected the largest outcome—that of the total frequency of terrorism committed by the global jihadist movement. Thus, the first hypothesis is unsupported. Also, three of the ten targets (Rabia, Atwah, and al-Zarqawi) did not yield significant changes to any outcome. This finding is particularly notable given that these three killings were also the only ones in the sample that caused civilian deaths. Thus, contrary to one of my hypotheses, targeted killings that involve civilian casualties were not more likely to lead to backlash effects. Perhaps the motivation, consistent with what Hepworth (2014) argued, was already at critical mass after their deaths. Or, it could be that these killings were

T A B L E 6

Summary of Results

Primary Target	Type of Target	Time Series*	Series Hazard	Civilians?
al-Harethi	Political	No significant effects	Significantly decreases hazard of highly lethal attacks	No
Rabia	Political	No significant effects	No significant effects	Yes
Atwah	Military	No significant effects	No significant effects	Yes
al-Zarqawi	Political/Military	No significant effects	No significant effects	Yes
Habib	Military	Significantly increases frequency of suicide attacks	No significant effects	No
bin Laden	Political	No significant effects	Significantly decreases hazard of suicide attacks	No
al-Rahman	Military	Significantly increases frequency of suicide attacks	Significantly increases hazard of suicide attacks	No
al-Awlaki	Political	Significantly increases frequency of suicide attacks	Significantly increases hazard of Yemen attacks	No
al-Umda	Political/Military	Significantly decreases frequency of suicide attacks	Significantly increases hazard of highly lethal attacks and decreases al Qa'ida, suicide, and Yemen attacks	No
al-Libi	Political	No significant effects	Significantly decreases hazard of al Qa'ida attacks	No

*Results after sensitivity analyses.

not viewed as more indiscriminate than others. Given the previously discussed controversy surrounding definitions of civilian casualties, terrorists may view all killings in this way.

Three of the high-profile killings did produce effects consistent with a deterrence perspective, namely, al-Harethi, bin Laden, and al-Libi. The first leader did alter the more detrimental outcome of highly fatal attacks, which is somewhat supportive of my hypotheses regarding substitution effects. Similarly, bin Laden's death did not affect any outcome after the control for the 9/11 anniversary was included except that of suicide attacks. The third target, al-Libi, was also one of two leaders to have a differential influence on attacks perpetrated solely by those in al Qa'ida, giving small support to another of my hypotheses. Nevertheless, all of these leaders were considered to be primarily political at the time of their deaths, making other predictions regarding type of target unsupported in this situation. Furthermore, two of the three leaders that yielded increases in terrorist outcomes were considered military, which is also contrary to what was posited based on prior research.

Specifically, the death of military leaders Habib and al-Rahman led to significant increases in the frequency and hazard of suicide attacks. al-Awlaki's death also had effects consistent with backlash in that the frequency of suicide attacks and Yemen-based incidents increased after his killing. As previously discussed, al-Awlaki's death was critiqued more so than that of other targets given his American citizenship and the related implications

for due process. This makes retaliation after his killing, particularly within the country in which he was killed, especially notable. The country-specific effects, found with al-Awlaki and al-Umda, are also supportive of our last hypothesis in that effects should theoretically be more prevalent in the area where the killing occurred. Yet, these two killings were the only ones of the sample to have location-specific effects. al-Umda's death also produces the most complex findings in that he was considered both a military and a political leader and his death is associated with both deterrent and backlash effects. Again, and related to my hypotheses regarding displacement, if a countermeasure decreases certain outcomes (al Qa'ida, suicide, and Yemen-based terrorism) while increasing others (highly lethal), that countermeasure becomes immaterial. This becomes exacerbated if the outcome increased is also much more destructive, such as attacks involving 10 or more fatalities.

Conclusion

A methodologically robust assessment of the U.S. policy on targeted killings has been presented, which has yielded important findings not discovered in previous research. As a whole, the policy, as it relates to these 10 high-profile leaders of interest, has been negligible. Although small effects consistent with a deterrence perspective were discovered, these become inconsequential when their backlash counterparts are taken into account. Interestingly, these findings stand in contrast to Hepworth's (2014) assertions that the "risk of post-operational blowback is minimal" and that targeted killings "can be a very effective element of a larger counterterrorism strategy if utilized properly" (p. 14). Such disparate conclusions from two seemingly similar quantitative investigations further enforce the necessity of multiple efforts when assessing policy as important as this.

Similar to the findings of other work on backlash as it pertains to counterterrorism, the killings of al Qa'ida leaders may have rallied support for the global jihadist base. The controversial policy of targeted killings is likely viewed by this base as repressive, which is similar to Dugan and Chenoweth's (2012) findings regarding actions directed specifically toward Palestinians. In addition, targeted killings are often perceived as lacking legitimacy akin to internments used to combat terrorism in Northern Ireland (LaFree et al., 2009).

Nevertheless, it could be premature to declare targeted killings as a failed policy, particularly on the basis of 10 leaders. The only significant attacks on the U.S. homeland perpetrated by the global jihadist movement during this time period were those related to 9/11. This could be seen as a mechanism of these killings, although it is more likely a result of other targeted hardening and counterterrorism strategies. The increase in incidents could also have been larger without the killing of these leaders, but of course it is impossible to ascertain this. In addition, it would be remiss to consider the goals of these strategies as solely focused on decreasing terrorism. The killing of bin Laden may have served other purposes, particularly as it relates to American public opinion.

Important limitations to this work should be noted and inform future research. First and foremost, even though a rational choice perspective motivated this investigation, it is

nearly impossible to rule out other mechanisms that could have been responsible for these effects. Deterrence and backlash are certainly not the only explanations and should not be viewed as an “either/or” proposition. These perspectives are presented through this study as part of the larger theoretical explanation for the influence of targeted killings. An increase in terrorism could also be representative of terrorists ignoring the risks associated with their act or of a lack of consideration for possible punishment. Likewise, and although important controls were implemented and sensitivity analyses conducted, alternative explanations cannot be completely ruled out. Given the complex nature of the many conflicts during this time period, there may be historical threats to validity that remain unaccounted for in the models. For instance, the marked descriptive increases noted in 2006–2007 could be representative of the rise in insurgency violence or media coverage of that violence. Relatedly, the uptick from 2011–2012 could be representative of an instrumentation issue with the GTD. Future research should be conducted to narrow the mechanisms responsible for the effects found here and continue to replicate them in other contexts with other controls.

The long-term implications of targeted killings may also have yet to be realized, particularly as the intelligence concurrently seized in incidents like that of bin Laden’s becomes increasingly useful. It is also possible that, as previous scholars like Price (2012) have identified, although backlash is a factor in the short term, group mortality is a long-term process. Furthermore, and as Price (2012) also noted, the GTD is limited given the large number of incidents not associated with any one group. The aggregation of multiple groups as one outcome, and an outcome that finds a lack of significance, may be more of a factor of the malleable nature of this phenomenon and resulting group ties. There may also be targets, particularly military leaders like that of Abu Karar, who do influence terrorist outcomes as intended by counterterrorism officials. On the other side, there could be incidents with a higher number of casualties and perhaps a stronger backlash effect than those examined. Certainly, this could be the case with events like the 2009 strike on an al-Qa’ida training camp that led to the death of more than 40 civilians, yet did not result in the death of a high-profile target. Future research should be conducted to extend the timeline and the leaders analyzed beyond these subjects, along with examining those attacks not tied to a group, particularly as the movement becomes increasingly decentralized by ISIS and its affiliates. Even though the selection of targets was done systematically in this research, there still could be bias within these results.

Despite these important limitations, the research conducted in this study represents the most robust analysis of the U.S. policy on killings involving high-profile targets to date. As a whole, this policy seems to be one with important repercussions for the U.S. role in the international community, but it has yet to produce a substantial decrease in terrorism perpetrated by the global jihadist movement. It is probable that targeted killings are a controversial policy that will likely become more contentious given the limited effectiveness demonstrated here. Nonetheless, and as David (2003) predicted, “targeted killing may survive because it is indeed the least bad choice for a state confronted with the threat of terrorism” (p. 20).

Appendix A: List of Global Jihadist Movement by Group

Abdallah Azzam Brigades
 Abu Hafs al-Masri Brigade
 Abu Sayyaf Group (ASG)
 al Nusrah Front
 * al Qa'ida in Iraq
 * al Qa'ida in Lebanon
 * al Qa'ida in Saudi Arabia
 * al Qa'ida in the Arabian Peninsula (AQAP)
 * al Qa'ida in the Lands of the Islamic Maghreb (AQLIM)
 * al Qa'ida in Yemen
 * al Qa'ida Network for Southwestern Khulna Division
 * al Qa'ida Organization for Jihad in Sweden
 * al Qa'ida/al Qa'ida Core
 Al Shabaab al Muminin
 Al Shabaab—Affiliates
 al-Gama'a al-Islamiyya (GAI)
 al-Ittihad al-Islami (AIAI)
 al-Mua'qi'oon Biddam Brigade (Al Mouakaoune Biddam)
 Ansar al Din
 Ansar al Dine Mali
 Ansar al Jihad
 Ansar al Sharia Libya
 Ansar al Sharia Tunisia
 Ansar al Sunna
 Ansar al Tahwid wal Sunna
 Ansar Al Sunnah Palestine
 Ansar al-Islam
 Ansar Allah
 Ansar Jerusalem
 Ansar Sarallah
 Ansar Wa Mohajir Pakistan
 Ansaru Jamaatu Ansarul Muslimina Fi Biladis Sudan
 Ansaru ash Sharia Russia
 Ansarul Islam Pakistan
 Armed Islamic Group
 Asbat al-Ansar
 Boko Haram
 Caucasus Emirate
 Eastern Turkistan Islamic Movement
 Haqqani Network
 Harakat ul-Mujahidin
 Harkat-ul-Jihad al-Islami
 Hizbul Mujahideen (HM)
 Islamic Army in Iraq

Islamic Jihad Group
 Islamic Jihad Union Uzbekistan
 Islamic Movement for Change
 Islamic Movement of Uzbekistan (IMU)
 Islamic State of Iraq (ISI)
 Islamic State of Iraq and the Levant
 Jadid Al Qa'adah Bangladesh (JAQB)
 Jaish al-Taifa al-Mansoura
 Jaish-e-Mohammad (JeM)
 Jaysh al Muslimin Army of the Muslims
 Jemaah Islamiya (JI)
 Jundallah
 Lashkar e Balochistan
 Lashkar e Islam Pakistan
 Lashkar e Jhangvi
 Lashkar e Omar
 Lashkar e Taiba (LeT)—Associates
 Laskar Jihad
 Movement for Oneness and Jihad in West Africa (MUJAO)
 Mujahideen Army
 Pattani United Liberation Organization (PULO)
 Riyadus-Salikhin Reconnaissance and Sabotage Battalion of Chechen Martyrs (RSRSBCM)
 Sipah e Sahaba Pakistan (SSP)
 Sipah I Mohammed
 Special Purpose Islamic Regiment (SPIR)
 Takfir wa Hijra
 Taliban
 Taliban Pakistan
 Tawhid and Jihad
 Tehrik i Taliban Pakistan (TTP)

*Designates group was included in “al Qa’ida” analysis.

Appendix B: ARIMAX 9–11 Sensitivity Analysis

Attacks	Noise Model	Coefficient of Intervention	SE	z	p
Fatal Attacks					
Habib	ARIMA(2,0,0)	3.702	2.412	1.53	.126
bin Laden		.064	3.743	.16	.872
al-Rahman		6.964	7.929	.88	.380
al-Awlaki		41.823	64.247	.65	.515
Suicide Attacks					
bin Laden	ARIMA(1,0,1)	−.456	.530	−.86	.390

References

- Alston, Philip. 2010. Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions. *United Nations Human Rights Council*. Retrieved July 19, 2016 from www2.ohchr.org/english/bodies/hrcouncil/docs/14session/A.HRC.14.24.Add6.pdf.
- Anderson, Kenneth. 2009. Targeted killing in U.S. counterterrorism strategy and law. Retrieved July 19 from ssrn.com/abstract=1415070.
- Araj, Bader. 2008. Harsh state repression as a cause of suicide bombing: The case of the Palestinian–Israeli conflict. *Studies in Conflict & Terrorism*, 31: 284–303.
- Asal, Victor, Paul Gill, R. Karl Rethemeyer, and John Horgan. 2015. Killing range explaining lethality variance within a terrorist organization. *Journal of Conflict Resolution*, 59: 401–427.
- Becker, Howard S. 1963. *Outsiders: Studies in the Sociology of Deviance*. Glencoe, IL: Free Press.
- Belasco, Amy. 2009. *Troop Levels in the Afghan and Iraq Wars, FY2001-FY2012: Cost and Other Potential Issues*. Washington, DC: Library of Congress.
- Benmelech, Efraim, Claude Berrebi, and Esteban Klor. 2015. Counter-suicide-terrorism: Evidence from house demolitions. *The Journal of Politics*, 77: 27–43.
- Brantiff, William. 2014. *Testimony before the United States House Armed Services Committee Hearing on the State of Al Qaeda, its Affiliates, and Associated Groups*. Washington, DC: United States House of Representatives. Retrieved July 19, 2016 from start.umd.edu/pubs/STARTCongressionalTestimony_Stateof-AQandAffiliates_WilliamBraniff.pdf.
- Brym, Robert J. and Bader Araj. 2006. Suicide bombing as strategy and interaction: The case of the second intifada. *Social Forces*, 84: 1969–1986.
- Burns, John F. 2006. US strike hits insurgent at safe house. *New York Times*. June 8. Retrieved July 19, 2016 from nytimes.com/2006/06/08/world/middleeast/08cnd-iraq.html?_r=1.
- Canetti-Nisim, Daphna, Gustavo Mesch, and Ami Pedahzur. 2006. Victimization from terrorist attacks: Randomness or routine activities? *Terrorism and Political Violence*, 18: 485–501.
- Carson, Jennifer V. 2014. Counterterrorism and radical eco-groups: A context for exploring the series hazard model. *Journal of Quantitative Criminology*, 30: 485–504.
- Charles, Kerwin Kofi and Steven N. Durlauf. 2013. Pitfalls in the use of time series methods to study deterrence and capital punishment. *Journal of Quantitative Criminology*, 29: 45–66.
- Chiricos, Theodore G. and Gordon P. Waldo. 1970. Punishment and crime: An examination of some empirical evidence. *Social Problems*, 18: 200–217.
- Cochran, John K. and Mitchell B. Chamlin. 2000. Deterrence and brutalization: The dual effects of executions. *Justice Quarterly*, 17: 685–706.
- Condra, Luke N. and Jacob N. Shapiro. 2012. Who takes the blame? The strategic effects of collateral damage. *American Journal of Political Science*, 56: 167–187.

- Cornish, Derek and Ronald V. Clarke. 1986. Situational crime prevention, displacement of crime and rational choice theory. In (Kevin Heal and Gloria Laycock, eds.), *Situational Crime Prevention: From Theory into Practice*. London, U.K.: Home Office.
- David, Steven R. 2003. Israel's policy of targeted killing. *Ethics & International Affairs*, 17: 111–126.
- Dugan, Laura. 2011. The series hazard model: An alternative to time series for event data. *Journal of Quantitative Criminology*, 27: 379–402.
- Dugan, Laura and Erica Chenoweth. 2012. Moving beyond deterrence: The effectiveness of raising the expected utility of abstaining from terrorism in Israel. *American Sociological Review*, 77: 597–624.
- Dugan, Laura, Gary LaFree, and Alex R. Piquero. 2005. Testing a rational choice model of airline hijackings. *Criminology*, 43: 1031–1065.
- Dugan, Laura and Sue-Ming Yang. 2012. Introducing group-based trajectory analysis and series hazard modeling: Two innovative methods to systematically examine terrorism over time. In (Cynthia Lum and Leslie W. Kennedy, eds.), *Evidence-based Counterterrorism Policy*. New York: Springer.
- Fielding, David and Anja Shortland. 2010. “An eye for an eye, a tooth for a tooth”: Political violence and counterinsurgency in Egypt. *Journal of Peace Research*, 47: 433–447.
- Gibbs, Jack P. 1968. Crime, punishment and deterrence. *Southwestern Social Science Quarterly*, 48: 515–530.
- Hafez, Mohammed M. and Joseph M. Hatfield. 2006. Do targeted assassinations work? A multivariate analysis of Israel's controversial tactic during Al-Aqsa uprising. *Studies in Conflict & Terrorism*, 29: 359–382.
- Hepworth, Daniel P. 2014. Terrorist retaliation? An analysis of terrorist attacks following the targeted killing of top-tier al Qaeda leadership. *Journal of Policing, Intelligence and Counter-Terrorism*, 9: 1–18.
- Hsu, Henda Y. and Robert Apel. 2015. A situational model of displacement and diffusion following the introduction of airport metal detectors. *Terrorism and Political Violence*, 27: 29–52.
- Johnston, Patrick B. 2012. Does decapitation work? Assessing the effectiveness of leadership targeting in counterinsurgency campaigns. *International Security*, 36: 47–79.
- Jordan, Jenna. 2009. When heads roll: Assessing the effectiveness of leadership decapitation. *Security Studies*, 18: 719–755.
- Kaplan, Edward H., Alex Mintz, Shaul Mishal, and Claudio Samban. 2005. What happened to suicide bombings in Israel? Insights from a terror stock model. *Studies in Conflict & Terrorism*, 28: 225–235.
- Kovandzic, Tomislav V., John J. Sloan III, and Lynne M. Vieraitis. 2004. “Striking out” as crime reduction policy: The impact of “three strikes” laws on crime rates in US cities. *Justice Quarterly*, 21: 207–239.
- LaFree, Gary and Gary Ackerman. 2009. The empirical study of terrorism: Social and legal research. *Annual Review of Law and Social Science*, 5: 347–374.

- LaFree, Gary and Laura Dugan. 2007. Introducing the global terrorism database. *Terrorism and Political Violence*, 19: 181–204.
- LaFree, Gary and Laura Dugan. 2015. Global terrorism and the recent surge of violent Islamic extremism. Submitted for publication.
- LaFree, Gary, Laura Dugan, and Raven Korte. 2009. The impact of British counterterrorist strategies on political violence in Northern Ireland: Comparing deterrence and backlash models. *Criminology*, 47: 17–45.
- Lemert, Edwin M. 1951. *Social Pathology*. New York: McGraw-Hill.
- Linke, Andrew M., Frank D. Witmer, and John O’Loughlin. 2012. Space-time granger analysis of the war in Iraq: A study of coalition and insurgent action-reaction. *International Interactions*, 38: 402–425.
- Lum, Cynthia, Leslie W. Kennedy, and Alison Sherley. 2006. Are counter-terrorism strategies effective? The results of the Campbell systematic review on counter-terrorism evaluation research. *Journal of Experimental Criminology*, 2: 489–516.
- Mannes, Aaron. 2008. Testing the snake head strategy: Does killing or capturing its leaders reduce a terrorist group’s activity? *The Journal of International Policy Solutions*, 9: 40–49.
- McCauley, Clark and Sophia Moskalenko. 2014. Toward a profile of lone wolf terrorists: What moves an individual from radical opinion to radical action. *Terrorism and Political Violence*, 26: 69–85.
- McDowall, David. 1980. *Interrupted Time-Series Analysis*, vol. 21. Thousand Oaks, CA: Sage.
- Nagin, Daniel S. and Ray Paternoster. 1993. Enduring individual differences and rational choice theories of crime. *Law & Society Review*, 27: 467–496.
- National Consortium for the Study of Terrorism and Responses to Terrorism. 2013. Global Terrorism Database. Retrieved January 21, 2015 from start.umd.edu/gtd.
- Neumann, Peter, Ryan Evans, and Raffaello Pantucci. 2011. Locating Al Qaeda’s center of gravity: The role of middle managers. *Studies in Conflict & Terrorism*, 34: 825–842.
- Price, Bryan C. 2012. Targeting top terrorists: How leadership decapitation contributes to counterterrorism. *International Security*, 36: 9–46.
- Pridemore, William A. and Joshua D. Freilich. 2007. The impact of state laws protecting abortion clinics and reproductive rights on crimes against abortion providers: Deterrence, backlash, or neither? *Law and Human Behavior*, 31: 611–627.
- Radsan, Afsheen John and Richard W. Murphy. 2011. Measure twice, shoot once: Higher care for CIA targeted killing. *University of Illinois Law Review*, 4: 2010–2014.
- Sherman, Lawrence W. 1993. Defiance, deterrence and irrelevance: A theory of the criminal sanction. *Journal of Research in Crime and Delinquency*, 30: 445–473.
- Sherman, Lawrence W. and Richard A. Berk. 1984. The specific deterrent effects of arrest for domestic assault. *American Sociological Review*, 49: 261–272.
- Sherman, Lawrence W. and David Weisburd. 1995. General deterrent effects of police patrol in crime “hot spots”: A randomized, controlled trial. *Justice Quarterly*, 12: 625–648. doi: 10.1080/07418829500096221.

- Simon, Mallory. 2011. Full statement from Al Qaeda on Osama bin Laden's Death. *CNN News Blog*. Retrieved January 25, 2016 from news.blogs.cnn.com/2011/05/06/full-statement-from-al-qaeda-on-osama-bin-ladens-death/.
- The White House. Office of Press Secretary. 2011. Remarks by the President at the 'Change of Office' Chairman of the Joint Chiefs of Staff Ceremony. Retrieved November 17, 2015 from whitehouse.gov.
- Tittle, Charles R. 1969. Crime rates and legal sanctions. *Social Problems*, 16: 409–423.
- Tittle, Charles R. and Alan R. Rowe. 1974. Certainty of arrest and crime rates: A further test of the deterrence hypothesis. *Social Forces*, 52: 455–462.
- Tyler, Tom R. 2000. Social justice: Outcome and procedure. *International Journal of Psychology*, 35: 117–125.
- Van Linschoten, Alex S. and Felix Kuehn. 2012. *An Enemy We Created: The Myth of the Taliban-al Qaeda Merger in Afghanistan*. Oxford, U.K.: Oxford University Press.
- Wilner, Alex S. 2010. Targeted killings in Afghanistan: Measuring coercion and deterrence in counterterrorism and counterinsurgency. *Studies in Conflict & Terrorism*, 33: 307–329.
- Zussman, Asaf and Noam Zussman. 2006. Assassinations: Evaluating the effectiveness of an Israeli counterterrorism policy using stock market data. *The Journal of Economic Perspectives*, 20: 193–206.

Statute Cited

Authorization for Use of Military Force, 115 STAT. 224, P.L. 107-40 (2001).

Jennifer Varriale Carson is the coordinator for undergraduate research and an associate professor of criminal justice at the University of Central Missouri. She holds an M.A. and a Ph.D. from the University of Maryland—College Park in criminology and criminal justice. Her research interests center on policy evaluation and can be found in the *Journal of Quantitative Criminology*, *Prison Journal*, and *Terrorism and Political Violence*.