THE DEGRADATION EFFECTS OF TARGETED DRONE KILLINGS AGAINST AL-QAEDA IN THE ARABIAN PENINSULA

By

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Liberty University

A Dissertation Presented in Partial Fulfillment of the Requirements for the Degree

[Doctor of Philosophy]

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2023

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Abstract

One of the most significant national security threats of the 21st century is international terrorism from groups associated with the Global Jihadist Movement (GJM). Since the terrorist attacks on 9/11, this threat has been confronted through various counterterrorism measures accompanying the Global War on Terror (GWOT). One of the most widely used and controversial counterterrorism tactics that has been implemented is the targeted killing of terrorist leaders and facilitators using unmanned aerial drones. Often occurring outside legitimate theaters of war, targeted drone killings are heralded as an effective way to degrade the operational capability of terrorist organizations with minimal risk to military personnel. However, while targeted drone killings have become more prevalent since 9/11, their use has outpaced research on the effectiveness of such a tactic. Therefore, through the lens of organizational theory, this study quantitatively analyzed the degradation effects of targeted drone strikes against terrorist leaders and facilitators, otherwise known as high-value targets. Specifically, degradation was measured by determining if there is a loss of professionalism or capability in subsequent attacks following the targeted drone killing of the leader or facilitator. While targeted drone killings have been conducted across multiple Middle Eastern theaters against several terrorist organizations, the focus of the current study is the terrorist group Al-Qaeda in the Arabian Peninsula (AQAP), which is based in Yemen. Often considered the most active and dangerous Al-Qaeda affiliate, AQAP provides an effective case study to measure the effectiveness of targeted drone killings due to the group's location in Yemen and its distinct hierarchical structure.

Keywords: GWOT, counterterrorism, GJM, drones, organizational theory, AQAP

Table of Contents

List of Tables

List of Figures

List of Abbreviations

Global War on Terror (GWOT)

Al-Qaeda in the Arabian Peninsula (AQAP)

Al-Qaeda Central (AQC)

Global Jihadist Movement (GJM)

High-Value Target (HVT)

Central Intelligence Agency (CIA)

Al-Qaeda in Iraq (AQI)

Chapter 1: Introduction

Overview

Since the beginning of the 21st century, the United States has faced a variety of threats from international terrorists. Many of these threats have stemmed from a collection of radical Islamic terror organizations that adhere to a jihadi-Salafist ideology, otherwise known as the Global Jihadist Movement (GJM) (Berube & Dupont, 2019). As a result, the United States has utilized several tactics to combat the threat from the GJM. However, one of the most controversial counterterrorism tactics used to confront this threat is the targeted killing of terrorist leaders and facilitators, often outside declared war zones (Fisk et al., 2018). Targeted killings are thought to be a more efficient way to combat groups associated with the GJM, given that such adversaries are often non-state actors with sprawling networks across several countries (Fisk et al., 2018). Targeted killings can be defined as an operation in which a nation fighting terrorism kills an individual terrorist or group who is actively planning terrorist attacks or engaging in terrorist activity (Ganor, 2021). While not a new concept, targeted killings have become the central component of the American counterterrorism strategy (Walsh, 2018).

Targeted killings are conducted using different tactics. For example, a special forces raid was used to kill Osama bin Laden, while an airstrike was used to kill Abu Musab al-Zarqawi, the leader of Al-Qaeda in Iraq (Walsh, 2018). However, due to the evolution of unmanned aerial vehicle technology, many modern-day targeted killings are carried out by drones (Fisk et al., 2018). Drones are unmanned aerial aircraft piloted remotely via distant command stations where pilots monitor and attack targets in real-time (Walsh, 2018). Drones allow the United States to carry out targeted killings without putting military personnel at risk (Walsh, 2018). In addition, rather than use unguided bombs, modern military drones carry and fire small missiles with laser

precision (Williams, 2013). As a result, drones have become the preferred method for targeted killings in the 21st century (Blakeley, 2018).

Background

To understand the rise of targeted drone killings in the 21st century, it is necessary to begin with 9/11 and the ensuing Global War on Terror (GWOT). For many people living in the United States, the attacks on 9/11 represented their first experience with the terrifying and horrific effects of international terrorism (Bennett, 2018). Carried out by Osama bin Laden and the Al-Qaeda terrorist organization, the 9/11 attacks killed nearly 3000 people and undoubtedly represent the high point of the Global Jihadist Movement (GJM). However, twenty years later, the GJM remains the most significant worldwide terrorist threat (Carson, 2018).

In response to the 9/11 attacks, the United States and its allies launched the Global War on Terror. The initial aim of the GWOT was to utilize all aspects of American military power to preemptively prevent major terrorist attacks against the United States, its key interests, and its allies (Brands & O'Hanlon, 2021). The GWOT is most notable for utilizing conventional forces in two major ground wars in Iraq and Afghanistan. However, to survive the conventional military campaign of the GWOT, militants associated with the GJM evolved and organized into clandestine terror cells that blended with local civilian populations and hid in rugged terrain to avoid detection (Walsh, 2018). The resulting unconventional war made it difficult for the United States to exploit its significant advantage in conventional military power and rendered it incapable of effectively translating large quantities of troops into decisive victories against armed terror organizations (Walsh, 2018). Since 9/11 and the start of the GWOT, terrorist organizations associated with the GJM have continually evolved to become increasingly decentralized, further organizing into local branches (Bennett, 2018).

In order to counter the challenges stemming from the unconventional and decentralized nature of the GJM, the United States shifted its counterterrorism strategy from pursuit and interdiction tactics to pre-emptive and preventative activities (Silke, 2019). As a result, the counterterrorism policy of pre-emptively killing GJM leaders and facilitators through targeted drone killings became the cornerstone of the United States' counterterrorism strategy (Walsh, 2018). For example, there were 403 total drone strikes in Pakistan between 2004-2016 (Coyne & Hall, 2018). It is estimated that these strikes killed between 2,515 and 4,026 suspected militants (Blakeley, 2018). In Yemen, an estimated 156 strikes killed approximately 895-1,129 militants between 2002-2016, while an estimated 36 strikes from 2003-2016 killed 299-343 militants in Somalia (Coyne & Hall, 2018). Finally, between 2015 and 2018, anywhere from 3,334 to 4,569 suspected militants were killed in Afghanistan (Blakeley, 2018).

The Current Study

Proponents of drone killings contend that the targeted elimination of terrorist leaders and facilitators reduces the threat of the targeted group (Johnston & Sarbahi, 2016). Typically, the effects of targeted drone killings are measured using the outcomes of disruption or degradation. However, the current study focused only on degradation. The outcome of degradation is based on the idea that terrorism operates as a production line of activity (Silke, 2019). Specifically, this production line is made up of key leaders and facilitators that contribute to the success of terrorist activity (Silke, 2019). Therefore, targeted drone killings are theorized to result in degradation because such strikes eliminate terrorist leaders and high-value facilitators within this hierarchical structure, thus limiting the operational capability and professionalism of the organization (Johnston & Sarbahi, 2016).

The outcome of degradation was studied through the lens of organizational theory. Organizational theory suggests that leadership deficits lead a terrorist group to engage in less professional and politically risky attacks (Abrahms & Mierau, 2017). In addition, the loss of highly skilled and intelligent facilitators hinders the organization's ability to plan and carry out violence at the same level with the same complexity or professionalism (Johnston & Sarbahi, 2016). Under the framework of organizational theory, it is argued that leaders and high-level facilitators are scarce resources, possessing skills and knowledge that are irreplaceable when it comes to coordinating and influencing operations (Tominaga, 2019). Therefore, proponents of targeted drone killings argue that slain leaders are often replaced by less skilled or less experienced successors, resulting in the group making strategic and operational mistakes, leading to a reduced threat (Williams, 2013).

As mentioned above, the GJM became much more decentralized following 9/11 and the start of the GWOT, thus giving rise to several different terror branches. One of these branches is the Yemeni-based Al-Qaeda in the Arabian Peninsula (AQAP). Founded in 2009, AQAP has successfully taken advantage of the Yemeni government's failure to maintain security and order in the post-Arab Spring Yemen (Bolland & Ludvigsen, 2018). This led former President Barack Obama to describe AQAP as the most dangerous and active Al-Qaeda affiliate after continually showing their intentions to attack the United States (Bolland & Ludvigsen, 2018). As a result, a high number of drone strikes have been directed at AQAP in Yemen (Bolland & Ludvigsen, 2018). However, the effectiveness of these strikes has received little academic attention (Bolland & Ludvigsen, 2018).

Therefore, through the lens of organizational theory, the current study examined the degradation effects of targeted drone killings against Al-Qaeda in the Arabian Peninsula

(AQAP). Specifically, this study was conducted by analyzing if there is a correlation between the targeted drone killing of an AQAP high-value target and reduced professionalism or capability in subsequent AQAP attacks. Therefore, degradation was characterized by either a decrease in the number of deaths per attack, a decrease in attacks using explosives, or an increase in attacks against civilian targets. As a result, this study utilized three dependent variables: lethality, method of attack, and target. The targeted drone killing of an AQAP leader or facilitator served as the independent variable.

Problem Statement

Since the terrorist attacks on 9/11, the U.S. has increasingly relied on using unmanned aerial drones to combat Islamic militants associated with the GJM (Shah, 2018). However, despite the prevalence of targeted drone strikes against terrorist leaders and facilitators, there is no consensus on whether targeted drone killings are effective (Shire, 2020). This lack of consensus is partly due to the fact that the use of targeted drone killings has outpaced research on their effectiveness as a counterterrorism tactic (Gruenewald, 2017). As a result, the effectiveness of targeted drone killings remains disputed (Ludvigsen, 2018).

According to Gruenewald (2017), there is a lack of empirical evidence regarding the positive or detrimental effects of targeted drone killings. However, while there are studies that have examined the effectiveness of targeted drone killings in an empirical way, many of the existing studies have focused on the moral and legal arguments of such a tactic (Carson, 2017). In general, not enough is currently known about whether targeted drone killings degrade terrorist organizations or if such strikes have a detrimental effect and result in a backlash (Gruenewald, 2017).

This is especially true of the drone campaign against AQAP, where it remains undetermined if targeted killings have been effective, despite the high frequency of drone strikes against the Yemeni-based group (Bolland & Ludvigsen, 2018). As a result, the drone campaign against AQAP in Yemen is a field suitable for further study (Bolland & Ludvigsen, 2018). In addition, despite the limited body of empirical research, it is evident that drones represent the future of U.S. counterterrorism operations (Williams, 2013). Therefore, as the threat from GJM-related groups persists, the study of counterterrorism policies, such as targeted drone killings, will become increasingly important (Carson, 2017).

Purpose Statement

The purpose of the current study was to quantitatively measure the degradation effects of targeted drone killings of AQAP leaders and facilitators, also known as high-value targets (HVT). Specifically, this study examined if the targeted drone killing of an AQAP HVT is correlated with a loss of professionalism or capability in subsequent AQAP attacks. One independent variable and three dependent variables were utilized to conduct the study.

The primary independent variable was the targeted drone killing of an AQAP high-value target. According to Wilner (2010), there is a unique psychological consequence of being targeted by drones. As a result, the effects following a drone killing may be different from a targeted killing carried out by special forces or a conventional airstrike. Therefore, only targeted killings by drones were included in the study. Three dependent variables were utilized to quantify a loss of professionalism following a targeted drone killing: lethality, target, and method. Each dependent variable measured an aspect that contributes to the professionalism of a terror organization. The following paragraphs provide a brief overview of each dependent

variable and how it relates to the professionalism of a terror organization. In addition, an overview of the target population is provided.

Lethality

The variable *lethality* measured the number of deaths or injuries per attack before and after a targeted drone killing. A highly professional terror organization would also be highly lethal. However, most targeted drone killings are carried out under the assumption that terrorist plots are made up of a production line of activity comprised of a consecutive series of steps that lead to a successful and effective terrorist attack (Silke, 2019). Therefore, this variable measured if the removal of critical members of AQAP leads to less effective attacks, thus resulting in fewer fatalities or injuries per attack.

Target

The variable *target* measured the number of successful attacks against civilian vs. military targets before and after a targeted drone killing. Terrorist organizations usually fight for a constituency, whether real or imagined, and in return, require its support for survival in the long run (Shire, 2020). However, attacks against civilian rather than military targets can be seen as illegitimate by the constituency, which can have adverse effects on the organization's perceived legitimacy and public support (Shire, 2020). Therefore, a terrorist group's ability to sustain organizational strength and capability is mainly reliant on active sympathy and support from the public (Shire, 2020). As a result, terrorist organizations must take care to select appropriate targets to rationalize their attacks in the eyes of their constituents (Bastug & Guler, 2018).

Terrorist groups like Al-Qaeda and its affiliates are not blind to this fact and are always aware of public opinion and the value of social capital (Shire, 2020). To maintain public support,

leaders often implement enforcement mechanisms to prevent politically risky attacks involving civilians (Abrahms & Mierau, 2017). For example, the Taliban leadership has publicly rebuked, disarmed, imprisoned, or expelled members that violated organizational policies, such as targeting Afghan civilians (Abrahms & Mierau, 2017).

Most terrorist organizations do not make it past their first year in existence, where a significant factor in the collapse of such groups is the loss of public support due to the targeting of civilians (Taylor & Swanson, 2019). It is argued that when a terrorist leader is killed, the group may become more indiscriminate in their violence due to a lack of oversight, discipline, or restraint, redirecting their attacks from military to civilian targets (Shire, 2020). Indiscriminate violence against civilian targets can be detrimental to the organization's long-term survival as public sympathy, and grassroots support is eroded (Shire, 2020).

Method

The variable *method* measured the primary weapon used in attacks before and after a targeted drone killing. Specifically, this variable analyzed if there is a change in the number of attacks utilizing explosives following a drone killing. According to Luo and Qi (2022), explosives are the preferred method of attack for terrorist organizations worldwide. Terrorists prefer explosives for several reasons, including portability, concealability, and their ability to inflict widespread damage (Luo & Qi, 2022). However, while attacks involving explosives are frequently used and usually effective, they are difficult to carry out because such complex plots often require individuals with strong organizational and technical skills (Brands & O'Hanlon, 2021). As a result, the elimination of certain HVTs within AQAP should result in fewer attacks utilizing explosives.

Target Population

Finally, the primary target population of this study is the terrorist organization Al-Qaeda in the Arabian Peninsula, also known as AQAP. Officially founded in 2009, the AQAP organization is the result of a merger between Al-Qaeda's Saudi and Yemen branches (Bolland & Ludvigsen, 2018). As an affiliate of Al-Qaeda Central (AQC), AQAP operates in some accordance with its parent organization (Bolland & Ludvigsen, 2018). While AQAP maintains a decentralized appearance, it contains a distinct hierarchical structure, including military, political, propaganda, and religious branches (Bolland & Ludvigsen, 2018).

AQAP operates primarily in Yemen, which is an important conceptual detail due to its tumultuous political and economic landscape. Following the adoption of a democratic government in 1990, Yemen experienced several changes that permitted several political parties to exist while also allowing the citizens to elect their representatives to local councils, Parliament, and the presidency (Al-Kohlani et al., 2021). In 2011, amid rapidly declining popularity, the long-time president, Ali Abdullah Saleh, was forced to transfer power to his vice president, Abd Rabbuh Mansur Hadi (Al-Kohlani et al., 2021). However, in 2014, Hadi was also confronted with dissatisfied constituents, leading to a coup by the al-Houthi militant organization that sparked a war between several groups vying for control of the country (Al-Kohlani et al., 2021).

Since 2011, the ongoing conflict in Yemen has resulted in poor economic development and ongoing political instability (Al-Kohlani et al., 2021). According to the U.S. State Department (2020), the conflict has resulted in a significant political and security vacuum, which has given terrorist organizations such as AQAP increased room to operate. Since 2008, official draft counterterrorism legislation has been pending in Yemeni Parliament; however, due to

political instability, the legislation process has stalled, leaving Yemen without a comprehensive counterterrorism strategy (U.S. State Department, 2020). Therefore, due to the violence, instability, and its own limited capabilities, the Yemeni government is not able to enforce counterterrorism measures or carry out counterterrorism operations across the country (U.S. State Department, 2020). As a result, Yemen's unstable political and economic environment has led to a dramatic increase in terrorist attacks (Al-Hohlani et al., 2021). Consequently, with the cooperation of the Yemeni government, the United States has carried out over 326 confirmed drone strikes in Yemen since 2002, with the frequency of strikes rising sharply beginning in 2009 (Al-Hohlani et al., 2021).

As with any quantitative research study, it is necessary to try and account for any alternative independent variables that may influence the dependent variables. Therefore, in the case of the current study, it would be necessary to account for other counterterrorism measures besides targeted drone killings that may influence the lethality, method, and target selection of AQAP attacks. However, because of the security vacuum and political turmoil in Yemen since 2011, there are virtually no counterterrorism measures being enacted (U.S. State Department, 2020). As a result, the dependent variables for the current study were isolated from potential influences caused by counterterrorism measures not related to targeted drone killings. Consequently, the changes in lethality, method of attack, and target selection should be solely attributable to the effects of the targeted drone killings against AQAP high-value targets. Therefore, while the conflict and instability in Yemen have made it a haven for terrorists, such an environment is beneficial to the study of targeted drone killings as a counterterrorism strategy due to the lack of secondary counterterrorism measures.

Significance of Study

Since 9/11, the threat of Islamic extremist terrorism has been confronted using conventional means through the GWOT. For the most part, the United States achieved its fundamental strategic goals concerning the GWOT, that is, protecting the American homeland, polity, citizenry, economy, and way of life (Brands & O'Hanlon, 2021). However, the GWOT also inflicted a heavy cost from a human and monetary standpoint. As a result of the complications stemming from GJM tactics and the costs associated with the GWOT, some have argued that the United States could have adopted a less resource-intensive approach all along by using drones (Brands & O'Hanlon, 2021).

As the reliance on unmanned drones increases, it will be necessary for policymakers to reference data that shows how best to use such a tactic. However, much of the targeted killing literature has centered on its implementation's legitimacy and legality rather than its effectiveness as a counterterrorism policy (Blakeley, 2018). In addition, many of the studies examining the effectiveness of targeted drone strikes are conducted through the lens of rational choice and deterrence theory. Therefore, the current study examined the degradation effects of targeted drone strikes through organizational theory, rather than rational choice theory. Degradation through targeted drone killings is achieved due to highly skilled, intelligent, and influential leaders and facilitators being removed from the organization. As a result, this study contributed data that aid in assessing the effectiveness of targeted drone strikes through a light-footprint approach where no secondary counterterrorism measures are present.

A large percentage of targeted drone killings have been prosecuted against the terror group AQAP in Yemen. As Al-Qaeda's most lethal and active affiliate, AQAP has gained significant strength in post-Arab spring Yemen (Ludvigsen, 2018). As a result, an increased

understanding of AQAP is essential (Ludvigsen, 2018). However, in addition to measuring the effects of targeted drone killings against AQAP, the results of this study are relevant to other terrorist organizations. According to Fisher and Becker (2019), acts of counterterrorism against one terrorist organization should also affect others who are similarly motivated to commit such acts. As a result, it can be safely assumed that the studied effects of targeted drone killings are consistent from one group to the next, depending on their proximity to the targeted group (Fisher & Becker, 2019). Therefore, while AQAP appears to be decentralized, the group contains a definite hierarchical structure that includes many different branches, including political, military, religious, and propaganda (Bolland & Ludvigsen, 2018). Consequently, the applicability of the results of the present study to other terrorist groups depends on their proximity to the AQAP organization in terms of similar characteristics and structure.

Research Questions

The purpose of this study was to measure the degradation effects of targeted drone killings against AQAP leaders and facilitators, otherwise known as high-value targets (HVT). Specifically, this study determined if there was a correlation between a targeted drone killing and a loss of professionalism in subsequent AQAP attacks following the drone strike. As a result, the primary independent variable for this study was the targeted drone killing of an AQAP HVT. In order to measure a loss in professionalism, this study utilized three dependent variables of AQAP attacks: target, method, and lethality. Therefore, this study addressed the following research questions:

RQ1: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?*

RQ2: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?*

RQ3: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in the lethality of attacks?*

Definitions

1. *Targeted Killing (TK)* - The intentional killing of pre-identified terrorist leaders and facilitators carried out with governmental approval (Fisher & Becker, 2019).
2. *Signature Strike*- A type of targeted killing based on a person's behavior patterns instead of their known identity (Coyne & Hall, 2018).
3. *Drone* - Unmanned aerial vehicles used for a variety of purposes, including reconnaissance, surveillance, and targeted killing (Silke, 2019).
4. *Black Swan Event* - Terrorism event that is so unique and outside the norm that they are almost impossible to predict (Taylor & Swanson, 2019).
5. *Global Jihadist Movement (GJM)* - A collection of radical Islamic terror organizations that operate according to global Salafi-jihadist ideology. Groups include Al-Qaeda Central (AQC), Al-Qaeda in the Arabian Peninsula (AQAP), ISIS, etc… (Berube & Dupont, 2019).
6. *Global War on Terror (GWOT)* - Transnational and open-ended U.S. military campaign aimed at combatting terrorism following the attacks on 9/11 (Coyne, 2021).
7. *Arab Spring* - A revolutionary wave of political turmoil marked by widespread protests across the Middle East and North Africa, signaling the end of a long period of political stability in the region (Groizard et al., 2021).
8. *Lightning Bug* - An early unmanned aerial vehicle used to conduct photo reconnaissance during the Vietnam War (Williams, 2013).

9. *Disposition Matrix*- A sophisticated database containing information pertaining to individuals deemed a threat to U.S. interests (Blakeley, 2018).
10. *Law Enforcement Model*- A model used to assess the legality of targeted killing (Koven & Perez, 2022). This model equates targeted killings to unjustifiable homicide and believes that the response to terrorism should follow traditional criminal justice procedures, including prosecution, warrants, the right to legal counsel, the right to confront one's accusers, and a fair and speedy trial (Koven & Perez, 2022).
11. *Armed Conflict Model*- A model used to assess the legality of targeted killing (Koven & Perez, 2022). This model believes that the targeted killing of enemy combatants is justified as a matter of self-defense and national security (Koven & Perez, 2022). According to this model, targeted killings are considered permissible because there is no legal or moral requirement to arrest or capture suspected terrorists (Koven & Perez, 2022).
12. *Authorization for the Use of Military Force (AUMF)*- Legislation passed by congress following 9/11 that gives the President expanded authority to use lethal force against organizations, individuals, or nations that pose a threat to national security (Fisher & Becker, 2019).
13. *UN Charter*- The founding document of the United Nations that guides international law (United Nations, n.d.).
14. *Article 2(4)*- A section of the UN Charter that authorizes the use of lethal force under three circumstances: if the force is authorized by the UN; if the state is acting individually or collectively with other nations in response to an armed attack; if the host state gives consent to the acting state (O'Connell, 2022).

15. *Article 51*- A section of the UN Charter that authorizes the use of lethal force if the acting state can demonstrate it as an act of self-defense (Farer & Bernard, 2016).
16. *Unwilling or Unable Doctrine*- Used as justification by the United States for its use of lethal force outside its borders. According to this doctrine, lethal force outside of an acting state's borders is legal if a host state is incapable or unwilling to confront a threat (Birdsall, 2018).
17. *Degradation*- Outcome used to measure the effects of targeted drone killings against terrorist organizations. This outcome is based on the elimination of high-value individuals possessing critical skills, connections, and resources which leads to a loss in operational effectiveness (Johnston & Sarbahi, 2016).
18. *Disruption*- Outcome used to measure the effects of targeted drone killings against terrorist organizations. This outcome is based on the deterrent effect of successful drone killings, which forces surviving members to alter their behavior due to the fear of being targeted (Tominaga, 2018).
19. *Organizational Theory*- This theory serves as the basis for the current study. Organizational theory aids in assessing the leadership structure within an organization (Ludwick, 2020). Specifically, organizational theory assesses that the higher-ups within the hierarchical structure of an organization are more likely to have superior judgement and cognitive abilities, rendering them essential to the effective functioning of the organization (Abrahms & Mierau, 2017).
20. *Rational Choice Theory*- Criminological theory that believes offenders are rational actors who consciously seek pleasure and avoid pain (Ladegaard, 2018).

21. *Deterrence Theory*- Criminal justice theory that believes pain through punishment should be maximized to outweigh the potential benefits of committing a crime (Cullen & Jonson, 2017).
22. *Unconventional Warfare Doctrine*- Developed in the 1950s, this doctrine was designed to train the U.S. military to become experts in offensive guerilla warfare against standing governments (Blakeley, 2018). Previously, this training was only available to the CIA (Blakeley, 2018).
23. *Operation Phoenix*- Program developed to gather intelligence on suspected militants during the Vietnam War (Walsh, 2018). The goal of the program was to eliminate the Vietcong's infrastructure through killing, capturing, or interrogating leaders and sympathizers (Walsh, 2018).
24. *Operation Condor*- Program developed during the 1970s that created a covert network of intelligence agencies across several South American countries (Blakeley, 2018). The program simplified intelligence-sharing so that operatives could travel the area covertly to intercept militants for detention or elimination (Blakeley, 2018).
25. *Gnat and Amber Drones*- Early predecessors to modern day military drones (Williams, 2013). Developed in the 1980s, the Gnat and Amber drones were solely developed for surveillance and reconnaissance missions (Williams, 2013).
26. *MQ-1 Predator Drone*- Modern military drone that made its debut flight in 1994 (Williams, 2013). Initially developed as a reconnaissance aircraft but became capable of carrying out targeted killing operations after 2000 (Williams, 2010). The MQ-1 Predator was deployed immediately after 9/11 and became the primary weapon of the targeted killing campaign against the GJM (Williams, 2010).

27. *MQ-9 Reaper Drone*- Successor to the MQ-1 Predator drone. Entered service in 2007 and is capable of flying at three times the speed and carry fifteen times the weaponry as the MQ-1 Predator (Williams, 2010).
28. *SPSS*- Computer software used to conduct statistical research (Field, 2018).
29. *Assumptions*- Conditions that data must meet to use certain statistical tests. Violations of assumptions can cause a multitude of issues that can lead to errors in statistical outcomes (Shatz, 2023).
30. *Chi-Square Test of Independence*- Statistical test used to determine the relationship between two categorical variables by comparing the frequencies observed to the frequencies expected by chance (Field, 2018).
31. *Non-Parametric Tests*- Statistical tests that do not rely on strict assumptions (Field, 2018).

Chapter 2: Literature Review

Overview

The following chapter provides an exhaustive overview of the relevant literature pertaining to targeted drone killings; therefore, this chapter contains multiple sections. First, this chapter discusses the conceptual literature regarding targeted drone killings. This section includes information pertaining to the definition of targeted killing, the history of targeted killing, the rise of unmanned drones, signature strikes, legal issues, and an overview of the structure of terrorist organizations, specifically AQAP. The second section discusses the theoretical foundations of targeted drone killings. Specifically, this section includes an advanced analysis of organizational theory, which is the basis for the present study**.** However, while the current study focused on degradation through the lens of organizational theory, this literature review also includes a section dedicated to the outcome of disruption and its associated theories. Finally, the third section presents the current literature regarding the effectiveness of targeted drone killings. This section includes literature on degradation and disruption through various outcome variables and the potential backlash effects of targeted drone killings.

The majority of the references cited in this literature review were published in the last five years. There are also a limited number of references that were published more than five years ago. However, the articles dated more than five years ago are only used to provide important historical and conceptual information about targeted drone killings. Therefore, the information gleaned from these more dated articles has not changed and is still relevant to the conceptualization of the current study.

Definition of Targeted Killing

A targeted killing is an offensive operation where a nation fighting against terrorism attacks a specific terrorist organization or individual who is engaged in directing, initiating, preparing, or planning terrorist attacks, for the purpose of killing them (Ganor, 2021). According to Walsh (2018), a targeted killing contains two elements. First, a targeted killing is intended to kill its target rather than to force a surrender or retreat (Walsh, 2018). Second, a targeted killing is directed against an individual or group of individuals pre-identified by the perpetrator (Walsh, 2018). Therefore, a common element of targeted killing definitions is the deliberate, intentional, and premeditated use of lethal force (Carson, 2017). Targeted killings are carried out in various contexts and may be used by governments in times of war and peace (Silke, 2019).

However, the definition of targeted killing is a contentious topic among counterterrorism experts, decision-makers, policymakers, scholars, human rights advocates, and military and intelligence practitioners (Ganor, 2021). Much of the controversy surrounding the definition of targeted killing stems from the fact that it is not always clear how targeted killings differ from illegal extrajudicial killings or assassinations (Walsh, 2018).

Assassinations and targeted killings are considered different acts since the term assassination implies murder, whereas targeting terrorists as a form of self-defense is not considered a crime (Koven & Perez, 2022). Targeted killings for the purpose of self-defense exist outside the assassination prohibition because national leaders are obligated to protect their citizens, similar to the way local police protect and defend their communities (Koven & Perez, 2022). Therefore, the dilemma is not whether targeted killing is the same as an assassination but whether targeted killing is a legitimate act of self-defense (Koven & Perez, 2022).

History of Targeted Killing

While targeted killing through drones is a relatively modern phenomenon, the tactic of strategically killing enemies is an ancient concept (Koven & Perez, 2022). For example, the Sicarii engaged in targeted killings in ancient Jerusalem beginning in 60 A.D. (Abrahms & Mierau, 2017). Similar examples include the killing of the father of Alexander the Great in 336 B.C. and Julius Caesar in 44 B.C. (Koven & Perez, 2022). Ancient Indian and Chinese administrations routinely engaged in targeted killings through specialized state organizations (Koven & Perez, 2022). More recent examples include the U.S. killing of Japanese Admiral Isoroku Yamamoto during World War II, the U.S plot to kill Mohammed Mosadegh of Iran in 1953, and the killing of Jacob Guzma of Guatemala in 1954 (Koven & Perez, 2022).

The modern use of targeted killing in the GWOT can be traced to the *unconventional warfare* doctrine developed by the U.S. military and the Central Intelligence Agency (CIA) during the Cold War (Blakeley, 2018). In the 1950s, the unconventional warfare doctrine was designed to give the U.S. military a capability that was formerly restricted to the CIA (Blakeley, 2018). As a result, U.S. special forces were trained to become experts in offensive guerilla warfare against standing governments (Blakeley, 2018).

During the Vietnam War, Operation Phoenix gathered intelligence with the goal of eliminating the Vietcong's political infrastructure through killing, capturing, or interrogating leaders and sympathizers (Walsh, 2018). In 1971, William Colby, the director of the Phoenix program between 1968 and 1971, assessed that over 20,000 Vietcong leaders were killed while the program was operational (Blakeley, 2018). Following the implementation of Operation Phoenix during the Vietnam War, Operation Condor became operational by 1975. Operation Condor involved a covert network that connected the intelligence agencies of Argentina, Brazil,

Chile, Paraguay, Bolivia, and Uruguay with the CIA (Blakeley, 2018). The program aimed to simplify intelligence-sharing so that operatives could move through the area covertly to intercept insurgents for detention and elimination (Blakeley, 2018).

The unconventional warfare doctrine and the subsequent Phoenix and Condor programs provided the framework for the targeted drone campaigns of the 21st century. A critical aspect that connects Operation Phoenix and Operation Condor with the targeted drone strikes of the 21st century is the method of gathering intelligence and developing lists of people to be targeted (Blakeley, 2018). In addition, the Vietnam war saw the first use of remote-controlled unmanned drones known as Lightning Bugs (Williams, 2013). While not used for targeted killing, the jet-powered Lightning Bugs provided high-altitude reconnaissance that assisted missions against the North Vietnamese and Vietcong (Williams, 2013).

The Emergence of the MQ-1 Predator Drone and MQ-9 Reaper Drone

The Lightning Bugs of the Vietnam war served as initial proof of concept for the armed drones of the 21st century; however, the true predecessors of modern-day drones were the UAVs known as the Amber and Gnat (Williams, 2013). Developed in the 1980s, the Gnat and Amber drones were purely developed for surveillance and reconnaissance missions (Williams, 2013). Technological advances led to the creation of the MQ-1 Predator drone, which made its debut flight in 1994; however, much like the Gnat and Amber, its primary purpose was as a reconnaissance aircraft (Williams, 2013). In late 2000, the decision was made to arm the Predator to make it capable of carrying out targeted killing operations (Williams, 2010). As a result, the MQ-1 Predator was deployed immediately following the attacks on 9/11 and became the primary weapon of the targeted killing campaign against the GJM (Williams, 2010).

The Predator drone was first utilized in October 2001 when it fired missiles at pro-Taliban troops surrounding an anti-Taliban commander; however, this initial offensive display proved unsuccessful (Williams, 2010). In November 2001, an armed Predator was again utilized with more success, where it killed nearly one hundred Al-Qaeda sympathizers in coordination with American F-15 fighter jets (Williams, 2010). In late 2002, the Predator carried out its first true targeted killing when a strike killed Senyan al-Harethi, the organizer of the USS Cole bombing that murdered 17 and wounded 39 (Carson, 2017). The capabilities of unmanned drones were further improved with the development of the MQ-9 Reaper, built by the same company as the MQ-1 Predator (Williams, 2010). The Reaper entered service in 2007 and was equipped with a much larger engine, making it capable of carrying fifteen times the weaponry as the Predator and able to fly at three times the speed (Williams, 2010).

The rise of armed drones such as the Predator and Reaper would not have been possible without the simultaneous advancement of global satellite communications networks (Walsh, 2018). This satellite technology allowed drone pilots to control the aircraft and receive communications intelligence and video in real-time from across the globe (Walsh, 2018). At the start of 21st century, the United States was in a technological position to combine drones, surveillance technology, and communications infrastructure to bring to reality the possibility of identifying and targeting terrorists from a great distance and at no risk to U.S. military members (Walsh, 2018). In addition to satellite technology, other advancements such as high-resolution cameras and sensors were developed during the 1990s that were conducive to the goal of developing unmanned drones capable of offensive counterterrorism operations (Walsh, 2018). The convergence of a transnational network of terrorists targeting U.S. interests and the general failure of nation-building to contain terrorism in Afghanistan and Iraq created the political and

strategic motivations to combine global satellite communications, high-resolution cameras and sensors, and global positioning systems with existing unmanned drone technology to create an effective targeted killing weapon (Walsh, 2018).

The increased use of drones in America's counterterrorism policy is based on the idea that they are more effective and efficient at achieving the government's foreign policy goals than the alternatives (Coyne & Hall, 2018). As a result, the U.S. has almost solely relied on drones for targeted killings since 9/11 (Shah, 2018). Drones such as the Predator and Reaper reduce the potential harm to U.S. servicemembers while targeting terrorists in remote areas (Coyne & Hall, 2018). The apparent advantage of drones is that they operate without an onboard crew. This allows the drone to loiter for extended periods over a target and to venture into areas that would otherwise be dangerous for soldiers or an aircrew to enter, thus keeping military members out of harm's way (Walsh, 2018). In military terms, drones project capability without showing vulnerability (Williams, 2013).

Targeted Killings and Signature Strikes

Most targeted drone killings are based on evaluations of specific individuals considered a threat to U.S. interests (Blakeley, 2018). To conduct such strikes, profiles are collected and compiled into a complex database known as a *Disposition Matrix* (Blakeley, 2018). The data contained in the matrix includes specific information regarding known terrorists and their alleged location and options for killing them (Blakeley, 2018). This data is combined with existing kill lists from the U.S. Special Forces and the CIA (Blakeley, 2018).

Comparatively, drone killings conducted as *signature strikes* are based on specific patterns of behavior rather than information contained in the Disposition Matrix (Coyne & hall, 2018). These patterns of behavior are pre-identified as general signatures of terrorists (Coyne &

Hall, 2018). Therefore, signature strikes occur when an unmanned drone is used to kill an individual or group based on their observed behaviors rather than their known identity (Coyne & Hall, 2018). However, the pattern of behavior analysis used to conduct signature strikes is subject to being inaccurate and imperfect (Coyne & Hall, 2018). As a result, one of the downsides of signature strikes is that they are often less precise than targeted killings, which are based on information in the disposition matrix (Ludvigsen, 2018). Therefore, signature strikes have a higher chance of causing civilian deaths (Ludvigsen, 2018).

The Legality of Targeted Killing Using Drones

While the present study examines the degradation effects of targeted drone killings against AQAP, it is important to discuss the literature relating to the legality of such counterterrorism tactics. This study does not aim to determine if targeted drone killings are legal; however, an assessment of the legal aspects of targeted killings is appropriate for the conceptualization of the current study.

Legal Models of Targeted Drone Killing

Despite the prevalence with which it has been utilized since 9/11, targeted killing is not a term explicitly defined under international law (Silke, 2019). As a result, the act of targeted killing does not fit into any existing legal framework, thus leading to differing opinions on the legality of targeted drone killings (Silke, 2019). However, two general models are used when assessing the legality of targeted killings of suspected or known terrorists: the law enforcement model and the armed conflict model (Koven & Perez, 2022).

Law Enforcement Model

The law enforcement model contends that the response to terrorism should reflect the standards and procedures used in typical criminal justice policy, including prosecution, warrants,

the right to legal counsel, the right to confront one's accusers, and a fair trial and speedy trial (Koven & Perez, 2022). Therefore, proponents of the law enforcement model assert that the targeting of terrorists should only be permitted in situations where the target poses an unavoidable or imminent threat to civilian lives, and killing the target is the only way to prevent the threat from materializing (Koven & Perez, 2022). According to the law enforcement model, targeted drone killings are legally unacceptable in most cases and should be classified as extra-judicial killings (Koven & Perez, 2022). Furthermore, under the law enforcement model, targeted drone killings are comparable to unjustifiable homicide, where unknown executioners select individuals from a list for death (Koven & Perez, 2022).

Armed Conflict Model

In contrast, the armed conflict model permits the military to act against individuals as *enemy combatants* whose behavior and methods violate the rules of war (Koven & Perez, 2022). Therefore, proponents of the armed conflict model argue that a lethal response to terrorism is justified as a matter of self-defense and national security. Through this lens, terrorists are considered war criminals because they often target and kill civilians, thus removing the question of legality (Koven & Perez, 2022). Therefore, in direct contrast to the law enforcement model, targeting terrorists with lethal force is acceptable even if they are not believed to be an imminent threat to others (Koven & Perez, 2022). Proponents of the armed conflict model argue that the removal of targeted killing tactics is analogous to an unacceptable abandonment of a nation's responsibility to protect its citizens (Koven & Perez, 2022). Moreover, according to this model, targeted killings against known or suspected terrorists are justified to prevent future attacks, regardless of the location of the targeted individual (Koven & Perez, 2022).

Drone Campaigns Post-9/11

Since 2001, the United States has been engaged in two different drone campaigns, one prosecuted by the U.S. military as a part of counterterrorism operations in Afghanistan and Iraq, and one conducted by the CIA as part of its counterterrorism operations to disrupt Al-Qaeda and accompanying forces (Birdsall, 2018). The drone campaign conducted by the U.S. military in Iraq and Afghanistan was used primarily as support for ongoing operations in the GWOT (Bidrsall, 2018). As a result, the targeted drone killings carried out in Iraq and Afghanistan are not considered unlawful because the United States was actively engaged in a war (Birdsall, 2018). However, the targeted drone campaign conducted by the CIA presents a murkier situation from a legal standpoint.

The CIA campaign is considered legally controversial because it has been conducted in geographic areas where the United States military is not directly involved, such as Somalia, Pakistan, and Yemen. These extraterritorial drone strikes began in 2001 in support of Operation Enduring Freedom in Afghanistan (Brookman-Byrne, 2017). In addition, while the drone campaigns of the Afghanistan and Iraq wars have, for the most part, been transparent, the CIA campaign is largely kept secret, away from public and judicial oversight (Birdsall, 2018). Therefore, while targeted drone killings in times of war are considered legal despite ethical and moral challenges, no domestic or international law deals specifically with targeted killings outside of areas of official armed conflict.

Legal Justification of Targeted Drone Killings

Historically, the United States has referenced three legal frameworks to justify its use of targeted drone killings: the Authorization for Use of Military Force (AUMF), and Article 2(4) and Article 51 of the UN Charter.

Authorization for Use of Military Force (AUMF)

In reference to domestic law, the AUMF was passed by congress three days following the 9/11 attacks. The AUMF provides the president with expanded authority to use any appropriate force against those known to have aided the 9/11 attacks (D'Errico, 2018). In addition, the AUMF permitted the president to use lethal force against organizations, individuals, or nations for the purpose of preventing future terrorist attacks (Fisher & Becker, 2019). As a result, this policy was conducive to the use of weaponized drones in Iraq, Afghanistan, Pakistan, and Yemen (Fisher & Becker, 2019).

While the AUMF is specifically tied to the response to 9/11, it does not limit the use of lethal force to those responsible for the 9/11 attacks (Birdsall, 2018). In addition, a broad interpretation of the AUMF allows for the use of lethal force outside the active battlefields of Iraq and Afghanistan (Birdsall, 2018). The Obama administration argued that the AUMF provided the legal authority to target additional organizations, such as ISIS, which are more loosely affiliated with the 9/11 attacks than groups like the Taliban and Al-Qaeda (D'Errico, 2018). Subsequently, the Trump administration continued this broad interpretation of the AUMF's reach (D'Errico, 2018). The power granted by the AUMF has no end date and no geographic restrictions; therefore, no location is outside the use of targeted killing authority (D'Errico, 2018). As a result, the existence of a clearly delineated battlefield is irrelevant to the use of lethal force because a state of war between two nations can exist even if formal battlefields are not readily identifiable (Koven & Perez, 2022). The only limitation of the AUMF is determined by the targeted individual and whether they pose a terrorist threat, rather than the firm geographic restrictions of where the drone is being utilized (Birdsall, 2018).

UN Charter

Killing individuals outside the laws of armed conflict is illegal (Farer & Bernard, 2016). However, despite the uncertainties of using lethal force concerning international relations, targeted drone killings may be justified if a state can demonstrate that the conditions of non-international armed conflict are met (Farer & Bernard, 2016). Therefore, in terms of international law, the United States justifies its use of targeted drone killings outside of armed conflict by invoking Article 2(4) and Article 51 of the UN Charter (Birdsall, 2018).

Article 2(4). Within the UN Charter, Article 2(4) is understood as a general prohibition on using lethal force between nations (O'Connell, 2022). Therefore, a state may only use lethal force legally under an exception to the rule. Under Article 2(4), the use of lethal force targeting militants outside the laws of armed conflict is considered lawful under three circumstances: if the deadly force is first authorized by the UN Security Council; if the state is acting individually or collectively with other nations in response to an armed attack; if the host state gives consent to the acting state (O'Connell, 2022).

However, despite lawful exceptions to Article 2(4), a state using lethal action must also comply with the appropriate principles of international law applicable to the use of force, including proportionality, necessity, and attribution (O'Connell, 2022). In addition, Article 2(4) bans the use of force for the purpose of retaliation, deterrence, revenge, reprisal, or punishment, irrespective of whether the purpose of the action is to promote national security (O'Connell, 2018). The CIA drone strikes in Pakistan provide an appropriate example of the United States invoking of Article 2(4), as the campaign in Pakistan is based on claims that it is conducting the strikes with the host countries' consent (Birdsall, 2018). Despite the public condemning of the

targeted drone campaign within its borders, the Pakistani government has quietly endorsed the strikes, thus rendering the killings lawful under Article 2(4) (Birdsall, 2018).

Article 51. Comparatively, under Article 51, the use of lethal force outside armed conflict is considered lawful if the acting state can demonstrate it as an act of self-defense (Farer & Bernard, 2016). Historically, Article 51 allows for the use of lethal force in response to danger in the moment or to halt and repel armed attacks (O'Connell, 2022). In other words, Article 51 is intended for emergency use only, thus rendering the use of pre-emptive force outside armed conflict or the use of force days or weeks after an attack illegal because it is not for the purpose of ending attacks that are currently occurring (O'Connell, 2022). As a result, the primary questions relating to the invocation of Article 51 for targeted drone killings are based on whether pre-emptive action can be justified as self-defense (Birdsall, 2018).

In order to justify the use of pre-emptive lethal force in extraterritorial drone strikes, the United States has historically interpreted Article 51 by modifying the armed attack requirement and proof of the need or imminence requirement (O'Connell, 2022). According to Article 51 (Henderson, 2022), before the right to self-defense can be invoked, an armed attack must occur. However, customary international law allows for pre-emptive self-defense if a threat is considered imminent (American Journal of International Law, 2020). An imminent threat is defined as instant and overwhelming and leaving no time for deliberation (American Journal of International Law, 2020).

Imminence

Internal legal justifications for targeted drone strikes do not require the U.S. government to have specific evidence that an attack on U.S. citizens and interests will occur in the immediate future (Birdsall, 2018). Rather, targeted drone killings are carried out under the assumption that

terror groups such as Al-Qaeda are continually planning attacks against the U.S. and its allies, thus presenting a new kind of threat that is increasingly challenging to predict (Birdsall, 2018). Therefore, the threat posed by international terror groups requires that the concept of imminence be expanded to include those individuals who are constantly planning attacks, making the use of lethal force lawful (Birdsall, 2018). Under this paradigm, imminence is understood as not necessarily immediate, thus allowing for the broader use of lethal pre-emptive strikes (O'Connell, 2022). Under the Obama Administration, the Justice Department argued that the United States was permitted to utilize pre-emptive lethal force against individuals with the mere *potential* to carry out terrorist acts (O'Connell, 2022). In addition, the Justice Department argued that the U.S. had the right to kill individuals participating in the planning of *imminent* terrorist attacks (O'Connell, 2022).

Unwilling or Unable Doctrine

In addition to the argument from imminence, the United States also invokes the so-called *unwilling or unable doctrine* to justify its actions regarding pre-emptive self-defense. According to this doctrine, if a host state is unable or unwilling to take necessary action to prevent an attack, then the use of lethal force from the acting state in the interest of self-defense can be supportable on the basis of legal necessity (Henderson, 2022). However, there are a limited number of nations that have endorsed the unwilling or unable doctrine; thus, it can be argued that such a doctrine is an unreliable basis for states to justify lethal force in the name of self-defense; nevertheless, the United States continues to invoke the doctrine (O'Meara, 2022). Therefore, while the targeted drone campaign in Pakistan is justified through the consent of the host nation, the targeted drone campaign in Yemen and Somalia is justified as an act of self-defense under Article 51 of the UN Charter on the basis of imminence and the unable or unwilling doctrine.

Evolution of Legal Justification for Targeted Drone Killings

The justifications for using lethal force outside the laws of armed conflict have evolved over the years. For example, the Reagan administration cited an ongoing pattern of attacks as a replacement for the armed attack requirements described in Article 51 (O'Connell, 2022). Similarly, following the 1998 U.S. strikes on Al-Qaeda in Sudan and Afghanistan, the Clinton administration argued that the United States had experienced several attacks inside and outside the country, and Article 51 permitted the U.S. to retaliate under the circumstances (O'Connell, 2022). Specifically, the Clinton administration contended that the purpose of the targeted strikes was to deter and prevent future attacks (O'Connell, 2022). George W. Bush continued the tactic of targeted drone strikes outside legal armed conflict zones; however, the justification centered on the goals and scope of the Global War on Terror (O'Connell, 2022). As a result, rather than reference Article 51, the Bush administration justified its actions by arguing that the United States was engaged in a global war on terrorism, thus rendering the targeting of individuals legal due to their role in the war (O'Connell, 2022).

Bush's successor, Barack Obama, justified the use of targeted drone attacks outside armed conflict zones by stating that the United States was not engaged in a global war as the Bush administration had argued, but rather an *armed conflict* with Al-Qaeda and associate forces (O'Connell, 2022). When such an argument was seen as no better justification than the previous administration, the Justice Department drafted a memo that substituted the armed attack parameter of Article 51 for a right to use lethal force against individuals with the potential to engage in terrorism, thus broadening the definition of imminence (O'Connell, 2022). Also, similarly to Clinton, the Obama administration utilized the unwilling or unable doctrine to justify its targeted strikes against ISIS in Syria, despite Syria actively fighting the terror group

(O'Connell, 2022). The Trump administration focused on giving commanders in the field more leeway to decide when and where to carry out targeted drone strikes, in addition to justifying the strikes as acts of deterrence rather than self-defense (O'Connell, 2022). Finally, President Biden has adopted a policy between Obama and Trump; however, while the administration has argued that deterrence is the goal of targeted strikes, little legal justification has been provided (O'Connell, 2022).

In addition to the unable or unwilling doctrine, the broadening of the definition of imminence is justified by the U.S. by claiming that the concepts must become more flexible to adapt to the changing capabilities, technological innovations, and techniques of modern-day terrorist organizations (Birdsall, 2018). However, the right to anticipatory self-defense from imminent armed attacks outside official armed conflict zones remains uncertain according to international law (O'Meara, 2022). Despite this uncertainty, it can be argued that international law is an evolving system or a progression that follows and reacts to changes (Birdsall, 2018). According to this argument, the United States can be seen as operating through existing instruments of legal change; therefore, as the world's most powerful nation, it can exploit ambiguities resulting from contestations and advance a legal framework that accommodates its counterterrorism policies (Birdsall, 2018).

While not the focus of this study, the legal aspects of targeted drone killings outside the laws of armed conflict are relevant to the context of the present study. Any counterterrorism policy that uses targeted drone killings must consider the legality of using such measures. This is especially appropriate in the case of AQAP, as nearly all drone strikes against the terror organization have taken place in Yemen outside the traditional war on terror. Therefore, the legal arguments from the standpoint of self-defense, including the questions of imminence and the

unwilling or unable doctrine, should be a part of the decision to use targeted drone killings, in addition to the effectiveness of such a tactic.

Characteristics of Terrorist Organizations

According to Ganor (2021), the phenomenon of terrorism can be broken down into the motivation to carry out attacks and the capability to do so. As a result, for a terrorist attack to materialize, there must be sufficient motivation and resources present (Shire, 2020). Successful terrorist organizations often share three intervening characteristics that contribute to their motivation and capability: hierarchical structure, qualified human resources, and key material resources (Bolland & Ludvigsen, 2018). These intervening characteristics increase the likelihood that a terrorist organization will fulfill its goals to carry out deadly attacks while also sustaining itself (Bolland & Ludvigsen, 2018). Therefore, to understand the effects of targeted drone strikes against modern terrorist organizations, it is necessary to discuss the literature relating to these three characteristics.

Hierarchical Structure

In general, operating and maintaining an effective terrorist organization is difficult (Milton & Price, 2020). However, the presence of a hierarchical structure within a terrorist organization increases a group's effectiveness for three reasons. First, a hierarchical structure provides a centralized and concentrated command that has the capability to punish inept members and chastise poorly perpetrated attacks to ensure an effective and professional organization (Bolland & Ludvigsen, 2018).

Second, a centralized, hierarchical structure is critical to the planning and overseeing of external operations, often providing important religious, political, military, and media guidance (Bolland & Ludvigsen, 2018). For example, Shekau, the leader of the terrorist group Boko

Haram, exerted significant influence over the organization before his death in 2021, often setting goals for the group and deciding the types of attacks (Zenn, 2021). Similarly, despite the death of Osama bin Laden, Al-Qaeda maintains a leadership hierarchy comprised of senior leaders that provide guidance for lower-level members and sets the strategic course for the group (Zimmerman, 2021). Third, concentrated hierarchical structures are often organized into specialized functions that allow the organization to utilize available resources more effectively (Jordan, 2014). For example, Al-Qaeda's structure includes specific committees responsible for certain operational aspects, including a mobilization committee, an advisory council, and a military committee (Gartenstein-Ross, Barr, 2018).

AQAP's hierarchical structure is comprised of decentralized lone cells that maintain some freedom regarding attacks; however, AQAP leadership retains significant control over supervision and decision-making before attacks are carried out (Bolland & Ludvigsen, 2018). In addition, AQAP contains specific committees responsible for certain aspects of its operations, including military, religious, political, and propaganda branches (Bolland & Ludvigsen, 2018). Therefore, while AQAP may appear decentralized, its high-level leadership is often directly involved in planning and carrying out external operations (Bolland & Ludvigsen, 2018).

The hierarchical structure of a terrorist organization may be different depending on the specific group. For example, terrorist organizations with few levels of leadership often result in a simpler chain of command, thus rendering the role of the singular supreme leader more critical because they must be available to followers (Taylor & Swanson, 2019). Comparatively, more complex and bureaucratic organizations have numerous layers of leadership (Taylor & Swanson, 2019). As a result, the supreme leader is reduced to a more symbolic role, while the organization

relies on mid-level leaders to handle the face-to-face duties of the group (Taylor & Swanson, 2019).

A terrorist organization that lacks a hierarchical structure and supreme leader is ill-equipped to perpetrate complex attacks that require cooperation, communication, and training (Jordan, 2014). Therefore, a terrorist group with a hierarchical structure as opposed to a horizontal structure has an increased ability to balance the need to perpetrate attacks while also avoiding counterterrorism efforts (Milton & Price, 2020). However, depending on the level of influence and control over the group, the targeted killing of leaders can be effective when they act as the central hub of the organization (Yaoren, 2019).

Qualified Human Resources

Qualified human resources are understood as individuals within a group's hierarchical structure who possess transformational leadership skills and critical technical skills (Bolland & Ludvigsen, 2018). Attracting and recruiting individuals to a life of violence and hardship that comes with joining a terrorist group is difficult (Wilner, 2010). However, transformational leaders often possess charismatic personal qualities and ideas that attract followers (Taylor & Swanson, 2019). Charismatic leaders alter their followers' belief systems and behavior (Bolland & Ludvigsen, 2018). As a result, leaders foster personal sacrifice from their followers to achieve goals that benefit the whole organization (Bolland & Ludvigsen, 2018). However, in addition to attracting new followers, transformational leaders also sustain their followers' commitment to the organization and its cause (Taylor & Swanson, 2019). Conclusively, transformational leaders provide the organization with effective stability, judgment, and experience that aids in avoiding counterproductive behavior (Milton & Price, 2020).

In addition to the presence of charismatic leaders, successful terrorist organizations rely on members with critical technical skills who continually update their technological capabilities to refine their operations (Bolland & Ludvigsen, 2018). As a result, the ability to carry out transnational terrorist attacks requires individuals with critical skills such as organizational management, fundraising, financial management, intelligence, counterintelligence, weapons acquisition, bomb-making, and training (Bolland & Ludvigsen, 2018). During the years in which it perpetrated its most lethal attacks, Al-Qaeda maintained an extensive faction of members with these skills (Jordan, 2014).

Complex plots such as 9/11 require members with strong organizational and technical skills to be successful (Brands & O'Hanlon, 2021). Many members that possess critical technical and organizational skills are highly educated, with many holding medical, legal, and graduate degrees (Wilner, 2010). For example, to become the commander of the military committee of Al-Qaeda, one must have a minimum of five years of military experience, be at least thirty years old, and possess a college degree (Gartenstein-Ross & Barr, 2018). Similarly, numerous AQAP leaders and facilitators hold advanced university degrees, including Anwar al-Awlaki and Samir Khan (Bolland & Ludvigsen, 2018). Both men were educated in America and were essential to maintaining contact with radicals in western nations before their death (Bolland & Ludvigsen, 2018).

Key Material Resources

Key material resources are identified as financial resources, a refuge for high-level members, training infrastructure, and weapons (Bolland & Ludvigsen, 2018). Whether a terrorist organization is large or small, financing is a constant concern for group leaders (Taylor & Swanson, 2019). One of the many ways that terrorist organizations fund their operations is

through the international drug trade, which amounts to approximately $1.5 trillion annually (Taylor & Swanson, 2019). It is estimated that nearly $2.3 billion ends up in the hands of terrorists (Taylor & Swanson, 2019).

However, terrorist organizations also fund their operations through more legitimate channels such as real estate investments, salaries, or stock market trading (Teichmann, 2018). More recently, the emergence of cryptocurrency has been identified as a potential way for terrorist organizations to accumulate finances (Teichmann, 2018). Traditional bank transfers are often regulated, with supervisors monitoring all incoming and outgoing transfers; however, cryptocurrencies allow terrorists to send and receive funds while remaining anonymous (Teichmann, 2018).

AQAP funds most of its operations through the drug trade, robberies, illegal taxing, hostage ransoms, and fake charities (Bolland & Lugvigsen, 2018). From 2011 to 2013, AQAP earned roughly $30 million from hostage ransoms and significant support from Saudi donors (Bolland & Ludvigsen, 2018). In 2015, AQAP stole 13 billion Yemeni rials and $1.5 million from the Makulla central bank (Bolland & Ludvigsen, 2018).

Effective terrorist organizations also require an extensive training structure from which attacks can be safely trained for and planned (Taylor & Swanson, 2019). Otherwise known as an operational space, training infrastructure is found in both urban and remote areas that are safe from government presence or scrutiny, ensuring the safety of leaders and allowing for training (Taylor & Swanson, 2019). The AQAP organization possesses indoor and outdoor training spaces from which it can plan, organize, and launch attacks (Bolland & Ludvigsen, 2018).

According to Bolland and Ludvigsen, (2018), the final key material resource contributing to the success of terrorist groups is the acquisition of weapons. The armory of terrorist

organizations often consists of weapons acquired through several sources, including captured weapons, supplied weapons from state sponsors or other organizations, and weapons purchased on the black market (Taylor & Swanson, 2019). The AQAP organization has historically acquired weapons as a result of its ties to the al-Shabaab organization and its broader network (Bolland & Ludvigsen, 2018). In addition, AQAP has carried out attacks against Yemeni government forces and stolen a significant amount of weaponry, including small arms, rocket launchers, and tanks (Bolland & Ludvigsen, 2018).

Theoretical Framework for Targeted Drone Killings

Degradation and disruption are the two main outcomes used to measure the effects of targeted drone killings (Johnston & Sarbahi, 2016). However, disruption and degradation are based on different theoretical assumptions. Therefore, the following sections include literature pertaining to both degradation and disruption.

Theoretical Foundations of Degradation

The first outcome used to measure the effectiveness of targeted drone killings and the focus of the present study is degradation. However, rather than relying on anticipatory effects, the outcome of degradation results from the direct kinetic effects of targeted drone strikes (Mir, 2018). Therefore, through the targeted killing of critical organizational members, the ability of the group to operate effectively is degraded (Mir, 2018). Leaders and facilitators within the hierarchical structure provide critical judgment, experience, stability, and skills while also helping the group to avoid actions that are counterproductive (Milton & Price, 2020). Eliminating essential members within the hierarchical structure results in fewer resources, less time, and reduced expertise to carry out lethal attacks using sophisticated methods (Shire, 2020).

Organizational Theory

The present study utilized the outcome of degradation to measure the effects of targeted drone killings against AQAP leaders and facilitators. Specifically, the level of degradation was measured by analyzing variables relating to the professionalism of attacks following a targeted drone killing. As a result, this study analyzed degradation through the lens of organizational theory. Organizational theory has historically been applied to businesses, governmental agencies, nonprofit organizations, and educational institutions (Ludwick, 2020). According to Haveman and Wetts (2018), formal organizations are created when the goals of a group require the joint, sustained, and coordinated efforts of many members. Therefore, it is evident that terrorist groups meet the criteria to be characterized as a formal organization, making the application of organizational theory appropriate (Ludwick, 2020).

The use of organizational theory to understand the structure of terrorist organizations has many potential benefits. Primarily, organizational theory assists agencies tasked with implementing counterterrorism policy because such research helps examine the group's administrative aspects by identifying weaknesses within the leadership structure (Ludwick, 2020). This aids counterterrorism professionals by showing where to direct resources by providing clues as to the health of the organization and the potential effects of policies aimed at mitigating terrorist violence (Ludwick, 2020).

The purpose of organizational theory is to identify the most efficient and effective way to structure an organization to enable it to succeed (Ludwick, 2020). Specifically, the organizational theory model provides five levels of structure that are vital to the success of a formal organization: strategic apex, operating core, middle line, technostructure, and support staff (Ludwick, 2020). The strategic apex level represents the leader of the organization, while

the operating core refers to the individuals who do the primary work of the group (Ludwick, 2020). The middle line refers to individuals who fall between the strategic apex and operating core; technostructure references the individuals who plan and control the work, while the support staff refers to individuals who give indirect support to the organization (Ludwick, 2020). One of the main aspects of organizational theory focuses on how this organizational structure influences the capabilities of a group (Logan, 2020). According to organizational theory, the higher-ups within this hierarchical structure are more likely to have superior judgment, cognitive abilities, and focus to attain the goals of an organization (Abrahms & Mierau, 2017). Therefore, when applied to the study of the degradation effects of targeted drone killings, the elimination of the superior members of the terrorist group should result in an organization with degraded capabilities and reduced professionalism.

Theoretical Foundations of Disruption

The study of disruption is often based on the criminological theories of rational choice and deterrence. According to rational choice theory, criminals are rational thinkers who seek pleasure while consciously avoiding acts that lead to costly consequences (Ladegaard, 2018). Therefore, would-be offenders are self-interested actors who engage in a risk-reward calculation before committing a crime (Carson et al., 2019). If the reward is perceived to outweigh the risk or fear of punishment, the behavior in question will most likely occur (Carson et al., 2019). The second theoretical hypothesis of disruption is deterrence theory. Criminal justice policies based on deterrence theory operate through the lens of rational choice; therefore, deterrence theory suggests an inverse relationship between celerity, certainty, and severity of punishment (Fisher & Becker, 2019). Fundamentally, deterrence theory argues that pain through punishment should be maximized to outweigh the potential benefits of committing a crime (Cullen & Jonson, 2017).

Typically, deterrence is general or specific in nature. General deterrence seeks to prevent would-be offenders from offending (Fisher & Becker, 2019). As a result, by punishing a limited number of offenders, others are dissuaded from breaking the law (Cullen & Jonson, 2017). In contrast, specific deterrence results from a direct and specific warning or punishment (Ariel et al., 2019). Therefore, the deterrent effect is specific to the individual being punished (Cullen & Jonson, 2017).

When it comes to targeted drone killings, the outcome of disruption through deterrence is anticipatory in nature (Mir, 2018). Therefore, deterrence is successful because targeted drone killings force surviving members of a group to rethink the costs and benefits of engaging in terrorist activity, thus altering their behavior or stopping attacks altogether (Tominaga, 2018). Fundamentally, the mechanism of disruption through deterrence forces the surviving members of a group to adopt a defensive mindset rather than an offensive one, which is not conducive to an effective and lethal organization (Shire, 2020). Therefore, the fear of imminent death should result in several effects, including restricting the movement of organizational leaders and facilitators, limiting their ability to communicate, and promoting distrust among members (Mir, 2018). In addition, the deterrent effect of targeted drone killings may dissuade potential members from joining the organization (Coyne & Hall, 2018).

One crucial aspect of rational choice and deterrence theory is that such approaches rely on the rationality of offenders; however, terrorist behavior usually involves extensive planning, which suggests that its agents are indeed rational actors who carefully weigh the costs and benefits of their actions (Carson et al., 2019). According to Kattelman (2019), transnational terrorism is not random violence but rather an event used by rational entities with a strategic mindset. In addition, according to Unal and Uludag (2020), terrorists are rational fanatics.

Individual group members may possess irrational or extremist views; however, the organization embraces practical and rational priorities and uses terrorism to achieve a multitude of political goals (Unal & Uludag, 2020). As a result, the disruption of terrorist organizations through deterrence relies on raising the costs of participating in terrorist activity (Unal & Uludag, 2020).

However, according to Tominaga (2018), there are three reasons to believe that deterrence through the threat of punishment will not be effective against radical militant organizations. First, religiously motivated organizations are willing to die for a divine purpose, thus affecting the framework of rational choice and cost-benefit analysis (Tominaga, 2018). The end goal of radical Islamic extremism is an escalation of violence despite the consequences of the actions; therefore, such an ideology is difficult to deter through the punishment of death because death is the end goal anyway (Silke, 2019). Second, according to Tominaga (2018), terrorist violence is carried out for purely destructive purposes, leaving no room for negotiation. As a result, such violence is not strategic and is perpetrated to disrupt the social order (Tominaga, 2018). Third, terrorist militants lack a so-called return address (Tominaga, 2018). Essentially, deterrence measures are typically carried out toward territorially based targets; however, groups such as AQAP lack a home base of operations, thus making deterrence through threat implementation more difficult (Tominaga, 2018).

Current Literature

There are various studies that examine the effectiveness of targeted drone killings using the outcomes of degradation and disruption. While some studies argue that the targeted drone killing of terrorist leaders degrades or disrupts an organization’s ability to carry out attacks, other research suggests that such a policy has a negligible or counterproductive effect (Bastug & Guler, 2018). Therefore, the following analysis discusses the literature concerning the positive

and negative impact of targeted drone killings through the outcomes of both disruption and degradation.

Disruption

The outcome of disruption is typically analyzed through the lens of rational choice and deterrence theory. Therefore, due to the nature of such theories, many of the studies analyzing disruption rely on a qualitative method. This is because deterrence is aimed at altering an individual's choices; therefore, any research must focus on speaking to the actual perpetrators of the terrorism to determine if their behavior was disrupted as a result of targeted drone killings. There are a limited number of studies directly analyzing disruption; however, a consequential amount of qualitative data suggests that targeted drone killings have a disruptive effect on terrorist organization behavior (Coyne & Hall, 2018).

In a study conducted by Coyne and Hall (2018) examining the psychological effects of targeted drone killings, a Taliban prisoner described the deterrent effects of targeted drone killings: "The drones were terrifying. From the ground, it is impossible to determine who or what they are tracking as they circle overhead. The buzz of a distant propeller is a constant reminder of imminent death" (p.9). Similarly, according to a study by Shah (2018), the threat of drone strikes affects the methods of terrorist organizations, as one respondent stated:

> Forget about new members. The drone strikes either killed or drove the foreign and local militants underground. They could no longer roam freely, train openly, and force or entice the locals to join them. They had to worry about their own safety (pp. 55-56).

In addition, the study by Shah (2018) references a letter from Osama Bin Laden to his constituents which stated: "Over the last two years, the spying aircraft benefited the enemy greatly and led to the killing of many jihadi cadres, leaders, and others. This is something that is

concerning us and exhausting us" (p. 56). The research cited above provides a broad picture of the deterrent effects of targeted drone killings; however, other literature suggests that such killings specifically disrupt movement, communication, and trust within a terrorist organization (Mir & Moore, 2019).

Movement

In a study by Mir (2018), a Taliban member described the effects that targeted drone killings have on organizational movement: "When drones started flying, we became very careful about our movement. They surely made many of us anxious" (p. 72). In the same study (Mir, 2018), a Pakistani intelligence official described the effects of drones on terrorist movements: "Because of drone strikes on moving vehicles, groups started using motorbikes" (p. 72). A similar study by Mir and Moore (2018) concluded that the imminent threat of death by drone strikes did not eliminate terrorist movement but made it increasingly difficult for members to move for fear of being surveilled and targeted.

Communication

As a result of targeted drone killings, both leaders and midlevel members of Al-Qaeda and the Taliban limited their use of communications methods that could be intercepted and used for targeted strikes (Mir & Moore, 2018). As a result, many members of both organizations began to rely on shortwave radio sets (Mir, 2018). However, Al-Qaeda eventually implemented even more strict communication measures because of targeted drone strikes (Mir & Moore, 2018). In a study by Mir and Moore (2018), a lower-level member reiterated this communication policy: "We were told to avoid communication devices, including wireless sets" (p. 860).

As a result of the self-imposed restrictions regarding electronic communication devices, both the Taliban and Al-Qaeda organizations utilized human messengers for inter-group

communication, which caused extended gaps in communications and weak operational control (Mir, 2018). According to a study by Mir (2018), these communication restrictions affected mid and low-level members, as one interviewee stated: “Many were deeply frustrated that senior leaders would not stay in contact. In my second trip, I remember not seeing any senior leader nor getting communication for two months. We were told to concentrate on reading jihadi material” (p. 73). In the same study by Mir (2018), one Pakistan Taliban interviewee explained the difficulties of communication under the threat of targeted drone strikes:

> The senior leaders struggled to contact their subordinate commanders due to frequent flying of drones over the area…When [Hakimullah Mehsud] came to Miramshah, he would often quit meetings, avoid contact until drones flew overhead. Like him, other leaders avoided interacting and traveling with drones flying (p. 76).

Trust

The literature suggests that many members of terrorist organizations became increasingly concerned that some members were spies operating on behalf of the United States (Shah, 2018). Organization commanders believed that the success of U.S. drone strikes relied on intelligence provided by local spies (Mir & Moore, 2018). As a result, senior leaders within various organizations regulated whom they interacted with by limiting their exposure to only members considered trustworthy and capable (Mir & Moore, 2018).

In a study conducted by Shah (2018), a letter from Osama bin Laden’s chief deputy Atiyah Abd al-Rahman is referenced, stating: “We are facing difficulties due to the grave shortages in personnel in some cadres and the abundance of spies operating in our areas” (p. 56). An Al-Qaeda interviewee from a study by Mir (2018) reflected this sentiment: “Commanders would regularly change their locations and vehicles. Also, they kept their locations secret, as

there were reports that people within were providing information to the CIA" (p. 72). Similarly, in a study by Mir and Moore (2018), an Al-Qaeda member stated:

> Since the beginning of the drone attacks, the jihadi organizations have suffered immense pain. The pain became worse because it could not be treated. It enhanced distrust within jihadist organizations and among their people. We knew that targeting by drones was not possible without a high-quality spying network on the ground (p. 859).

In addition, a Taliban interviewee from a study by Mir (2018) described a situation where the fear of spies feeding intelligence to the U.S. had a detrimental effect on the recruitment of a new group of prospective members:

> After arrival of fresh cohorts from Karachi, Punjab, and Mohmand Agency, the number of drone strikes increased. So those in Mir Ali and Miramshah used to see them suspiciously. Amir Sahib decided that they should go back to where they had come from (p. 72).

Degradation

While the literature presented above points to a positive disruptive effect as a result of targeted drone killings, it could be argued that such behavior changes are useless if they are not accompanied by a degradation in capability. Therefore, the following section presents the literature that focuses on the outcome of degradation. A consistent theme within the degradation literature is the use of several variables that help to determine the effects of a targeted drone killing. As a result, the literature presented below focuses on the variables of lethality, frequency, attack method, target selection, and propaganda output.

Lethality, Frequency, and Attack Method

According to a study focusing on the terror group Al-Shabaab, Shire (2020) found that there was a reduction in suicide operations involving multiple bombers following the targeted killing of the organization's leader, Godane. However, Shire (2020) concluded that while the targeted killing of Godane affected preferences on attack modalities, it did not reduce the overall lethality or frequency of attacks. A similar study by Carson (2017) focused on the targeted killing of ten high-value Al-Qaeda members and determined there were some effects relating to degradation, including a small decrease in the lethality and hazard of attacks in three of the ten analyzed targeted killings. However, Carson (2017) concluded that the effects were mostly negligible.

A subsequent study by Carson (2018) utilized country-level controls to analyze the effects of targeted killings in Pakistan, Somalia, and Yemen. According to Carson (2018), there is evidence that targeted killings are related to a decrease in attack lethality. Comparably, a study by Yaoren (2019) focused on the terror group Hezbollah and used the targeted killing of the group's Chief of Staff, Imad Mughniyah. According to Yaoren (2019), there was a decrease in the frequency of attacks, which points to a degradation in mobilization following the targeted killing. Finally, according to Bolland and Ludvigsen (2018), targeted drone strikes intermittently degraded the capabilities of AQAP; however, the strikes failed to significantly weaken the organization to the point of not being able to attack the West.

Target Selection

According to Abrahms and Mierau (2017), the political effectiveness of a terrorist attack is based on the intended target. For example, selective attacks directed toward military targets are more strategic in relation to the goals of most terrorist organizations than indiscriminate violence

against civilian targets (Abrahms & Mierau, 2017). Attacks perpetrated against civilian targets may lead supporters to think that the organization is too violent or that involvement may be too dangerous, which is counterproductive in terms of support (Barcelo & Labzina, 2020). For example, a study by Barcelo and Labzina (2020) found that the size of ISIS's Twitter audience decreased significantly following a violent attack. It is theorized that the successful targeted killing of terrorist leaders results in the group becoming much less discriminate in their targets, redirecting their attacks from mostly military to civilian targets (Shire, 2020).

A study conducted by Shire (2020) analyzed targeted killings against the terror group Al-Shabaab and concluded that the strikes increased attacks against civilian targets. Therefore, the targeted killing of Al-Shabaab leaders did not decrease violence but led to an increase in indiscriminate attacks against civilians using unsophisticated methods (Shire, 2020). A similar study by Bastug and Guler (2018) found that civilians were targeted four times more often following the killing of ISIS and Al-Qaeda in Iraq (AQI) leaders Abu Musab al-Zarqawi, Abu Omar al-Baghdadi, and Abu Bakr al-Baghdadi.

Comparably, according to an article by Walsh (2018), the targeted drone campaign perpetrated against Al-Qaeda Central (AQC) weakened the organization's ability to supervise lower-level members to ensure that they only partake in attacks that align with the overall strategy of the organization. As a result, attacks on civilians increased because such attacks carry a lower risk of being captured or killed (Walsh, 2018). Furthermore, a study by Abrahms and Mierau (2017) concluded that the impact of targeted drone strikes against the Taliban had modest effects. However, Abrahms & Mierau (2017) also found that targeted drone killings caused major demographic shifts within the leadership hierarchy of the organization. As a result,

targeted drone killings reduced the organizational restraint towards attacking civilians by empowering subordinates with more freedom and autonomy (Abrahms & Mierau, 2017).

Propaganda Output

Propaganda production is a common component of effective terrorist organizations (Ludvigsen, 2018). For example, AQAP is known for producing the e-magazine *Inspire,* whose target audience is English-speaking Muslims living in the Western part of the world (Ludvigsen, 2018). In addition to motivating potential terrorists, the magazine includes an extensive how-to section that provides instruction on subjects such as bomb-making, guerilla tactics, weapons training, and security measures (Zekulin, 2021). The magazine is credited with specifically influencing and aiding attacks in recent years, including the Boston Marathon bombing and the San-Bernardino attack (Ludvigsen, 2018).

Critics of targeted drone killings argue that such strikes support recruitment through increased propaganda (Ludvigsen, 2018). According to Coyne and Hall (2018), terrorist groups subject to targeted killings use drone-created fear to increase support and recruitment through propaganda. In a study by Ludvigsen (2018), an analysis of AQAP's *Inspire* magazine found three dominant themes in the portrayal of drones. First, drones were often portrayed as ineffective tools while also signifying the weakness of the United States (Ludvigsen, 2018). Second, drones were portrayed as targeting innocent civilians and Muslims (Ludvigsen, 2018). Third, the use of drones was often portrayed as being a cowardly or inhumane way of fighting (Ludvigsen, 2018). A similar study by Walsh (2018) found that targeted drone strikes in Pakistan against Al-Qaeda did not result in a meaningful reduction of propaganda output. Therefore, according to Walsh (2018), such strikes were ineffective in degrading the organization's ability to continue critical activities that require coordination between leaders and facilitators.

Backlash Effects of Targeted Drone Strikes

Many detractors of the U.S. targeted killing campaign against GJM terrorists argue that such strikes cause blowback rather than reduce terrorist violence (Shah, 2018). According to critics, backlash occurs locally, nationally, or transnationally (Shah, 2018). Local backlash is described as a situation where an individual is killed in a drone strike, causing relatives to become anti-American militants seeking revenge (Shah, 2018). National backlash occurs when people are motivated to join or support terrorist organizations because they feel that their country's sovereignty has been violated by drones (Shah, 2018). Transnational backlash occurs when Muslims in other nations join terrorist organizations in response to the death of fellow religionists dying in targeted drone strikes (Shah, 2018).

According to Coyne and Hall (2018), targeted drone strikes have damaged the United States' credibility among sections of foreign populations and created support for the groups the strikes are intended to combat. Therefore, it is argued that targeted drone strikes give legitimacy and credibility to terrorist organizations, leading to increased recruiting and fundraising (Coyne & Hall, 2018). However, while the literature shows that terrorist organizations try to increase recruitment through anti-drone propaganda, the research pertaining to the effectiveness of such propaganda is less settled. For example, in a study by Mir (2018), one Al-Qaeda interviewee stated: "When I see the news that drone strikes have helped the militants recruit more people, I consider it false analysis…[both] Al-Qaeda and Pakistan Taliban had serious manpower shortages" (p.80).

However, while there is some debate as to whether targeted drone killings cause backlash, multiple empirical studies reveal evidence of blowback in addition to positive effects. For example, according to a study by Carson (2017), there was an increase in the frequency and

lethality of Al-Qaeda attacks following the targeted killing of their leaders. Therefore, while Carson (2017) concludes that there were some effects relating to a loss in operational capability, those effects are quickly negated when their backlash counterparts were added into the equation. A study by Fisher and Becker (2019) found that terrorist attacks in Yemen and Iraq increased significantly following the death of Osama bin Laden. Similarly, a study by Jaeger and Siddique (2018) found that targeted drone strikes against the Taliban led to a vengeance effect in the first week following a targeted strike. Furthermore, a study by Albert (2021) analyzed the effects of the targeted killing of Abubakar Shekau, the leader of Boko Haram, and concluded that the killing of terrorist leaders is likely to exacerbate rather than reduce the threat of terrorism.

Summary

The purpose of chapter two of the present research study was to provide important contextual and theoretical information regarding targeted drone killings. This information included literature pertaining to the definition and history of targeted killings from ancient times to the modern use of drones. In addition, literature related to the legality of using targeted drone killings in the GWOT was presented, along with the theoretical assumptions regarding the needs and organizational structure of terrorist groups. Furthermore, this chapter highlighted organizational theory as the framework for which degradation was measured in the present study. However, while the focus of the current study was degradation, this chapter also included a section dedicated to disruption. This section discussed the theories behind disruption and was included to provide a more thorough review of the literature pertaining to targeted drone killings. Finally, this chapter presented the current literature relating to the effectiveness of using targeted drone killings as a way to degrade or disrupt terrorist organizations. This section included studies

analyzing the positive and negative effects of targeted drone killings through several variables related to the operational capability of a terrorist organization.

Chapter 3: Methods

Overview

Proponents of drone killings contend that the targeted elimination of terrorist leaders reduces the threat of the targeted group (Johnston & Sarbahi, 2016). Therefore, the current study focused on degradation, which is based on the idea that terrorism operates as a production line of activity supervised by key leaders who orchestrate the success of terrorist activity (Silke, 2019). The purpose of the current study was to determine whether there are quantitative changes in select features of terrorist attacks following the targeted drone killings of HVTs and if the quantitative changes appear to constitute degradation. The focus of the current study is the terrorist organization Al-Qaeda in the Arabian Peninsula (AQAP). For the purposes of this study, leaders and facilitators were classified as high-value targets (HVTs).

This chapter is organized into 7 sections. The first section describes the study's design. The second section lists the research questions. The third section lists the hypotheses. The fourth section describes the participants and setting. The fifth section explains the derivation of this study's instrumentation. The sixth section describes data collection procedures. The final section describes data analysis.

Design

The research design of this study was a quantitative, before-and-after repeated measures group comparison (Field, 2018). Select features of AQAP terrorist attacks were compared before and after a successful strike on a known AQAP leader or facilitator (see sections below on samplings and instrumentation). The aim of this study was to quantify degradation effects. The before-and-after group comparison design is appropriate because it allowed the researcher to quantify changes before and after the loss of a key AQAP HVT to measure the acute impacts in

terms of what changes occurred, if the changes suggested operational degradation, and if so, quantified the statistical significance of the degradation. According to Field (2018), a group comparison enables a researcher to determine the effects of an intervention using two identical or related groups. The before-and-after group comparison design is therefore appropriate because it positions the successful strike on a known AQAP leader as a real-world proxy for an experimental *intervention* in which terrorist activity before the drone strike serves as the *control group* for comparison to terrorist activity after the strike.

Research Questions

The research questions below were derived from the problem and purpose statements. Each research question asks about the differences between the same variables before and after the *intervention* or successful drone strike on an AQAP HVT. The questions are clearly and specifically stated, restricted in scope, testable, and do not pose an ethical problem. Each research question implies a statistical analysis of a two-matched-group comparison.

RQ1: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?*

RQ2: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?*

RQ3: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in lethality of attacks?*

Hypotheses

This section lists the hypotheses that correspond to the above research questions. The number of hypotheses is based on the number of pertinent variables in the GTD. Each null hypothesis states the expected difference between the selected variables before and after the

successful strike of an AQAP HVT as a testable statement that is simply and concisely worded and founded on the problem statement. The null hypotheses for this study are two-tailed.

RQ1: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the numbers of civilian versus military attack targets.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the numbers of civilian versus military attack targets.

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the number of terrorist attacks.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the number of terrorist attacks.

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the number of successful attacks.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the number of successful terrorist attacks.

RQ2: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the explosive vs non-explosive method of attack.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the explosive vs non-explosive method of attack.

RQ3: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in lethality of attacks?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of fatalities from terrorist attacks.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the total number of fatalities from terrorist attacks.

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of injured in terrorist attacks.

- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the total number of injured in terrorist attacks.

Participants and Setting

The target population is the terrorist organization Al-Qaeda in the Arabian Peninsula (AQAP). Founded in 2009, the AQAP organization is the result of a merger between Al-Qaeda's Saudi and Yemen branches (Bolland & Ludvigsen, 2018). AQAP operates in some accordance with its parent organization Al-Qaeda Central (AQC); however, the group maintains a decentralized appearance (Bolland & Ludvigsen, 2018). In addition, the organization has a clear hierarchical structure built on military, political, propaganda, and religious branches (Bolland & Ludvigsen, 2018). AQAP operates primarily in Yemen.

The sample was composed of the select terrorist case reports listed in the Global Terrorist Database (START, 2022). The GTD is an event-level database composed of 200,000+ records of terrorist attacks that occurred around the world since 1970. It is maintained by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. The sample consisted of GTD entries that meet the criteria of occurring in Yemen and claimed by the AQAP terrorist group in the month surrounding the successful drone strike on an AQAP HVT. Specific details are described in the Instrumentation section.

The sample was a subset of the AQAP population composed of 17 successful drone strikes against AQAP HVTs. The 17 AQAP HVTs removed from leadership by US-targeted drone strikes were selected for the current study because of their status as a known/established facilitator or leader within AQAP before their death. The sample size of 17 AQAP leaders is broadly comparable to Carson (2017), who studied aspects of 10 targeted killings in Yemen, Pakistan, and Iraq.

The unit of measure for analysis was not each AQAP leader (Table 1) but the individual terror attacks that occurred before and after the removal of the targeted AQAP leader. Each Global Terrorism Database record of a terrorist attack (see Instrumentation section below) was a data point. Each was either coded as occurring in the two weeks before the successful drone strike or in the two weeks after the successful drone strike.

Table 1

Known Successful Drone Strikes on Leadership

AQAP Leadership	AQAP Leadership
Anwar al-Awlaki- 9/30/2011	Ali bin Likra al-Kazimy- 4/20/2014
Abdul Munim al-Fatahni- 1/31/2012	Shawki al-Badani- 11/4/2014
Fahd al-Quso- 5/6/2012	Harith bin Ghazi al-Nadhari- 1/31/2015
Abdullah Awad al-Masri- 8/6/2012	Ibrahim al-Rubaysh- 4/12/2015
Ahmed al-Ziadi- 1/21/2013	Nasir al-Wuhayshi- 6/12/2015
Al-khidr Husayn al-Jadani- 7/30/2013	Jalal Balaidi- 2/3/2016
Qaid Ahmad Nasser al-Dhahab- 8/30/2013	Abu Khaled al-Sanaani- 9/22/2016
Mujahid Gaber Saleh al-Shabwani- 3/3/2014	Abu Anis al-Abi- 1/21/2017
	Qasim al-Raymi- 1/29/2020

Instrumentation

This section explains the derivation of this study's instrument from the free access, archived data available from the Global Terrorism Database (GTD), University of Maryland. The following explanations include the rationale for identifying records of terrorism cases that are pertinent to this study, pinpointing specific GTD variables that could quantify the three main topics of interest (target selection, method of attack, and lethality), and operationalizing variables of interest with summaries of the GTD coding standards. To distinguish the GTD from the smaller database drawn from it and assembled for this study, the assembled database is hereafter called the Yemen Database.

Reports of terrorist attacks were assembled from the GTD as follows. First, a list was constructed of the 17 verifiable AQAP HVTs killed in targeted drone strikes (Table 1). Second,

GTD terrorist cases that occurred in the two weeks before and two weeks after each successful HVT drone strike were downloaded based on the following three criteria: (1) those that occurred in Yemen (GTD category Attack Location (Country): Table 2, (2), were claimed by the AQAP terrorist group (GTD category Perpetrator Group Name: Table 2, and (3) occurred two weeks before and two weeks after the successful strike.

For each terrorist attack, the GTD chronicles information on up to three perpetrator group names or sub-names as well as details regarding claims of responsibility for the attack. Perpetrator attributions in the GTD reflect what is reported in open-source media accounts, which does not necessarily indicate a legal finding of culpability. In order to ensure consistency in the usage of group names for the database, the GTD database uses a standardized list of group names that have been established by project staff to serve as a reference for all subsequent entries. If the formal perpetrator group or organization is not reported in source materials, the GTD perpetrator field may contain relevant information about the generic identity of the perpetrator(s) (e.g., "Protestant Extremists"). Generic categories do not represent discrete entities and are not exhaustive or mutually exclusive. They also do not characterize the behavior of an entire population or ideological movement. For many attacks, generic identifiers are the only information available about the perpetrators. As a result, they are included in the GTD database to provide context; however, analysis of generic identifiers should be interpreted with caution. If no information about the perpetrator group is available, this field was coded as "Unknown." Cases labeled as unknown perpetrators were excluded from the Yemen database.

Although the goal was to compare the characteristics of terrorist attacks two weeks before the removal of an HVT to two weeks after the removal, the before and after interval was necessarily based on the records that are available in the GTD. That is, if there are GTD records

of AQAP activity in the two weeks before and the two weeks after the successful drone strike against the leader (Table 1), two weeks was the before-after time interval. Otherwise, before and after dates were chosen based on available records of AQAP activity around the drone strike and examined separately from terror attacks that occurred within the designated two-week window.

The following GTD variables were included in the Yemen Database and measured to determine whether they reflect degradation after the successful strike on an HVT. They are explained below in terms of the research question with which they were associated. Table 2 shows that five GTD categories informed the aims of this study.

Target Selection

One of the three main variables of interest in this study, target selection, was addressed in answering RQ1 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?) with the following GTD variables.

Civilian vs Military Attack Targets

RQ1 was addressed directly with data from the GTD Target/Victim category (Table 2). The GTD target/victim information fields are coded for type, name of entity, specific target/victim, and nationality of the target/victim. They contain information on up to three targets/victims for each attack. The field contains information on both intended targets and attacks on bystanders. The GTD target/victim type field captures the general type of target/victim in one of 22 categories.

In the Yemen database, the 22 categories of type of target/victim were analyzed as a dichotomous (dummy coded) variable created to distinguish *easier* more accessible civilian targets from *tougher* less accessible military targets for analysis. Specifically, the researcher dummy coded the GTD categories, designating 17 as easier civilian targets with the numeric

dummy code 1 (the following numbers are GTD codes): 1 = Business, 2 = Government (General), 5 = Abortion Related, 9 = Food Or Water Supply, 8 = Educational Institution, 10 = Journalists & Media, 11 = Maritime (includes ports and maritime facilities), 12 = NGO, 13= Other, 14 = Private Citizens & Property, 15 = Religious Figures/Institutions, 16 = Telecommunication, 17 = Terrorists/Non-State Militias, 18 = Tourists, 19 = Transportation (Other Than Aviation), 21 Utilities, and 22 = Violent Political Parties. The researcher designated four GTD categories as tougher military targets with the numeric code zero (the following numbers are GTD codes): 3 = Police, 4 = Military, 6 = Airports & Aircraft, 7 = Government (Diplomatic). The final GTD category (Unknown) was coded in the Yemen database as missing data. The rationale was that an increased number of civilian targets after a successful drone strike may reflect degradation.

Number of Terrorist Attacks

RQ1 was also answered with data from the GTD list of terrorist attacks two weeks before and two weeks after the successful drone strike, which was tallied and compared. The rationale was that a reduced number of attacks may reflect degradation.

Number of Successful Terrorist Attacks

RQ1 was also answered with data from the GTD category, number of successful attacks (Table 2). The rationale was that a reduced number of successful attacks after the drone strike may reflect degradation. The GTD definition of a successful attack depends on whether the attack type took place. GTD defines the success of a terrorist strike according to the tangible effects of the attack, not in terms of the larger goals of the perpetrators. If a case had multiple attack types, it is successful if any of the attack types were successful, with the exception of assassinations, which are only successful if the intended target is killed. A bombing is successful

if the bomb or explosive device is detonated. Bombings are considered unsuccessful if they do not detonate; the success or failure of the bombing is not based on whether it hit the intended target. In the GTD, success was dummy coded (0 = not successful, 1 = successful). This convention was followed in the Yemen database assembled for the current study.

Method of Attack

The second of the three main variables of interest in this study, method of attack, was addressed in answering RQ2 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?). This GTD category of Attack Information (Table 2) captured nine categories of general methods of attack. Typically, only one attack type is recorded for each attack. However, for attacks that involved multiple attacks, as many as three attack types were recorded. When multiple attack types apply, the most appropriate value is determined based on the following hierarchy (note that numbers are GTD codes, not rank orders): 1 = Assassination, 4 = Hijacking, 6 = Kidnapping, 5 = Barricade Attack, 3 = Bombing/Explosion, 2 = Armed Assault: use of firearm, 8 = Unarmed Assault, 7 = Facility/Infrastructure Attack, and 9 = Unknown. For example, if an assassination is carried out through the use of an explosive, the Attack Type is coded as Assassination, not Bombing/Explosion. If an attack involved a sequence of events, then the first, the second, and the third attack types were coded in the order of the hierarchy above rather than the order in which they occurred.

In the Yemen database, the method of attack was examined dichotomously by distinguishing explosives from other methods (Table 2) with dummy codes. The GTD category Bombing/Explosion was coded 1. The other methods of attack were coded zero. Before dummy

coding, however, all three GTD attack types were searched (if they exist) for the 'Bombing/Explosion' code and coded as such in the Yemen database.

Lethality

The third of the three main variables of interest in this study, lethality, was addressed in answering RQ3 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in lethality of attacks?). This Casualties and Consequences GTD category (Table 2) includes the number of total confirmed fatalities for the attack. The number includes all victims *and* attackers who died as a direct result of the attack. Where there is evidence of fatalities, but a figure is not reported or it is too vague to be of use, this field remains blank. If information is missing regarding the number of victims killed in an attack, but perpetrator fatalities are known, this value reflects only the number of perpetrators who died as a result of the attack. Likewise, if the information on the number of perpetrators killed in an attack is missing, but victim fatalities are known, this field only reported the number of victims killed in the attack.

Where several independent sources report different numbers of casualties, the GTD usually reflected the number given by the most recent source unless the source itself is of questionable validity or if the source based its casualty numbers on claims made by a perpetrator group. When there are several "most recent" sources published around the same time, or there are concerns about the validity of a recent source, the majority figure was used. Where there is no majority figure among independent sources, the database listed the lowest proffered fatality figure, unless that figure came from a source of questionable validity or there was another compelling reason to do otherwise.

The GTD took the following steps to preserve statistical accuracy. When several cases are linked together, sources sometimes provide a cumulative fatality total for all of the events rather than fatality figures for each attack. In such cases, the preservation of statistical accuracy was achieved by distributing fatalities across the linked attacks. It was noted in the "Additional Notes" field whenever cumulative totals were divided across multiple events. This method for preserving statistical accuracy was also used for calculating the values for the following fields when individual event totals were unknown: "Number of U.S. Fatalities," "Number of Perpetrator Fatalities," "Total Number of Injured," "Number of U.S. Injured," and "Number of Perpetrators Injured."

Table 2

GTD Variables Used in the Current Study to Compose the Yemen Database

Yemen Database Variables	Global Terrorism Database (GTD) Categories
Yemen	III. Attack Location (Country):
AQAP	VII. Perpetrator Information (Perpetrator Group Name)
RQ1: Target Selection	VI. Target/Victim Information (Civilian vs Military)
RQ1: Target Selection	IV. Attack Information (Number of Attacks)
RQ1: Target Selection	IV. Attack Information (Number of Successful Attacks)
RQ2: Method of Attack	IV. Attack Information (Explosive vs Non-explosive)
RQ3: Lethality	VIII. Casualties and Consequences (Total Number of Fatalities)
RQ3: Lethality	VIII. Casualties and Consequences (Total Number of Injured)

Procedures

This section describes the procedures in a chronological step-by-step format. Liberty IRB permission to conduct the study was solicited. Once permission was granted, the select GTD data described in the above Instrumentation section of this chapter was accessed from the free access, archived data available from the Global Terrorism Database (GTD), University of Maryland. The GTD data are archival. Therefore, it is not necessary to obtain agency permission to access the data. Furthermore, because the GTD data are archival, procedures did not involve soliciting

participants for this study, obtaining signed consent forms, conducting a pilot study to establish the reliability of the data collection instrument, or training individuals to implement treatment. Table 2 lists the GTD data that were assembled to create this study's Yemen database.

Moreover, information from the GTD codebook was provided in the Instrumentation section (above). The overview is that a list of 17 successful strikes against AQAP HVTs was assembled on the basis of the following rationale. The GTD terrorist cases related to the listed successful drone strikes (Table 1) were downloaded. Although the goal was to compare the characteristics of terrorist attacks two weeks before the removal of an HVT to two weeks after the removal (Abrahms & Mierau, 2017), the before and after interval was based on the records that are available in the GTD. The data was downloaded into an excel file, coded following the Yemen database codes, and transferred to an SPSS v 28 spreadsheet for analysis.

Data Analysis

The unit of measure was individual terrorist attacks that occurred in Yemen by AQAP. Each record represented a terrorist attack. Therefore, each record was a data point coded as either before or after the successful drone strike. In the current study, the independent variable was the real-world experimental *intervention* of the removal of an AQAP HVT. The dependent variables were the before and after measures of variables obtained from the GTD (Table 2).

Data analysis involved comparing matched samples on select variables from the GTD with paired samples *t* tests. These inferential group comparison tests were appropriate for answering this study's research questions by testing each of the hypotheses listed above because the research questions ask about specific relationships between before and after measures, and paired samples *t* tests are designed to evaluate the statistical significance of the difference between means as well as quantify the effect of the independent variable on the dependent

variable (Weaver & Goldberg, 2012). The *t* test assumptions included comparing data measured on a continuous scale whose variance was non-significantly different or homogenous (Weaver & Goldberg, 2012). The GTD data was screened to establish whether the data meet these assumptions. For variables that violated these assumptions, the non-parametric counterpart (the Wilcoxon test) was used. Effect sizes were also calculated with Cohen's *d* whose values are interpreted as .2 = small effect, .5 = medium effect, and .8 = large effect (Weaver & Goldberg, 2012). Significance was set at $\alpha = .050$. Analyses were run on dedicated statistical software SPSS v 28.

Chapter 4: Findings

Overview

The purpose of the current study was to measure the degradation effects of targeted drone killings against the terrorist organization Al-Qaeda in the Arabian Peninsula (AQAP). As a result, this study quantified degradation by measuring changes in select features of AQAP attacks before and after a targeted drone killing of an AQAP HVT. This chapter shows the findings of the study and is organized into three sections. First, the research questions and accompanying hypotheses are presented. Second, this chapter provides the descriptive statistics associated with the statistical analysis. Finally, the third section presents the main statistical findings.

Research Questions

RQ1: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the numbers of civilian versus military attack targets.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the numbers of civilian versus military attack targets.

RQ2: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the explosive vs non-explosive method of attack.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the explosive vs non-explosive method of attack.

RQ3: *Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in lethality of attacks?*

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of fatalities from terrorist attacks.

- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference the total number of fatalities from terrorist attacks.

- H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of injured in terrorist attacks.
- H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference the total number of injured in terrorist attacks.

Descriptive Statistics

The following section presents the descriptive statistics for the current study. The Yemen database was assembled for this study from records in the Global Terrorism Database (GTD) to provide descriptive information on terrorist attacks before and after successful drone strikes on the AQAP HVTs (Table 3). Records of terrorist attacks were assembled from two weeks before the successful drone strike on an HVT and two weeks after the strike.

HVTs

HVTs are leaders and facilitators of terrorist organizations. The total of $N = 468$ records of terrorist attacks were evenly divided before the strikes (49%, $n = 230$ records) and after the strikes (51%, $n = 238$ records). Data covered 8 years (2011-2017 and 2020). Most of the terrorist attack records (82%) were from three years (2013-2015).

Table 3

List of HVTs Involved in Successful Drone Strikes and Dates of Terrorist Attacks comprising the Yemen Database

AQAP HVT	Two Weeks Before & After
1. Anwar al-Awlaki 9/30/2011	16 September - 14 October
2. Abdul Munim al-Fatahni- 1/31/2012	17 January – 14 February
3. Fahd al-Quso- 5/6/2012	22 April – 20 May
4. Abdullah Awad al-Masri- 8/6/2012	23 July – 20 August
5. Ahmed al-Ziadi- 1/21/2013	7 January – 4 February
6. Al-khidr Husayn al-Jadani- 7/30/2013	16 July – 13 August
7. Qaid Ahmad Nasser al-Dhahab- 8/30/2013	16 August – 13 September
8. Mujahid Gaber Saleh al-Shabwani- 3/3/2014	17 February – 17 March
9. Ali bin Likra al-Kazimy- 4/20/2014	6 April – 4 May
10. Shawki al-Badani- 11/4/2014	21 October – 18 November
11. Harith bin Ghazi al-Nadhari- 1/31/2015	17 January – 14 February

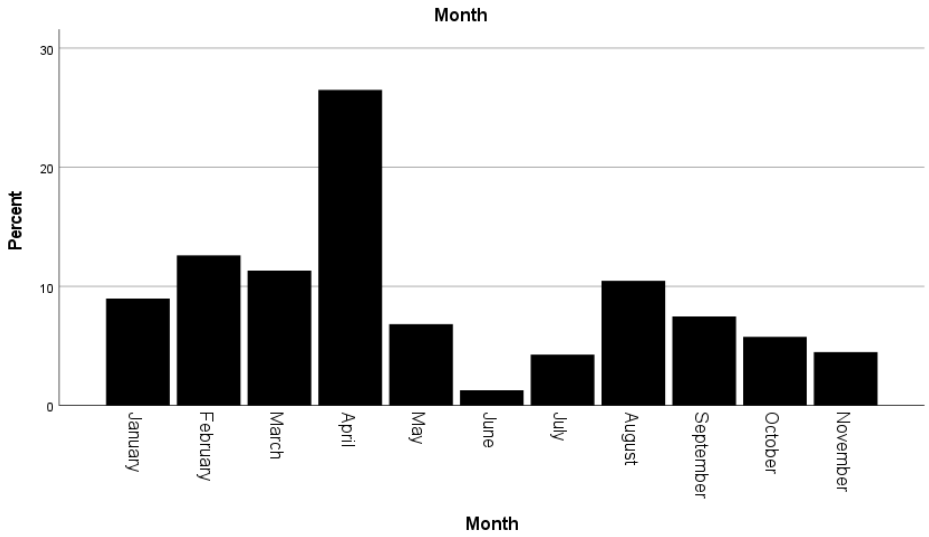
12. Ibrahim al-Rubaysh- 4/12/2015	29 March – 26 April
13. Nasir al-Wuhayshi- 6/12/2015	29 May – 26 June
14. Jalal Balaidi- 2/3/2016	20 January – 17 February
15. Abu Khaled al-Sanaani- 9/22/2016	8 September – 6 October
16. Abu Anis al-Abi- 1/21/2017	7 January – 4 February
17. Qasim al-Raymi- 1/29/2020	15 January – 12 February

Figure 1 illustrates the distribution of terrorist attack records by month. A quarter of the records (124 records, 27%) were from April. Another third of the records (34%) were approximately equal numbers from February (59 records), March (53 records), and August (49 records). June and July accounted for the lowest numbers of records (June: 6 records, July: 20 records).

To facilitate comparisons of terrorist tactics across terrorist groups, Table 4 lists the percentages and numbers of attacks by attack type (non-explosives and explosives) and target type (military and civilian) for individual leaders. Although there was variability in the nature and numbers of terrorist attacks across the 17 HVTs, some patterns emerged.

Figure 1

Temporal Occurrence of Terrorist Attack Records



Attack Method

For attack method before the successful drone strike on an HVT, 11 leaders (65%) had at least a 2:1 ratio of non-explosives to explosives (leaders 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, and 17), four leaders (24%) used approximately equal numbers of non-explosives to explosives (leaders 5, 7, 15, and 16), and two leaders (11%) had the opposite pattern of more explosives than non-explosives (leaders 13 and 14). For attack type after the successful drone strike on an HVT, 8 leaders (47%) showed at least a 2:1 ratio of non-explosives to explosives (leaders 2, 6, 7, 8, 9, 12, 13, and 15), 7 leaders (41%) used approximately equal numbers of non-explosives to explosives (leaders 1, 3, 4, 5, 10, 11, and 16), and only leader 14 (5%) used more explosives than non-explosives.

Target Selection

Table 4 shows that, for target selection before the successful drone strike on a HVT, three leaders (17%) had a 2:1 ratio of military to civilian targets (leaders 4, 11, and 15), four leaders (23%) had a 3:2 ratio of military to civilian targets (leaders 1, 2, 9, and 14), three leaders (17%) had approximately equal numbers of military and civilian targets (leaders 3, 5, and 8), and 7 leaders (41%) had more civilian than military targets (leaders 6, 7, 10, 12, 13, 16, and 17). For target selection after the successful drone strike on a HVT, 7 leaders (41%) had targeted more military targets than civilian targets (leaders 2, 3, 5, 9, 11, 14 and 15), three leaders (17%) had approximately equal numbers of military and civilian targets (leaders 1, 4 and 16), and 7 leaders (41%) had targeted more civilian targets than military targets (leaders 6, 7, 8, 10, 12, 13, and 17).

Table 4

Percentages (Number of Attacks) of Attack Types and Target Types Before and After the Successful Drone Strike on a HVT

	Before		After		Before		After	
	Attack Type		Attack Type		Target Type		Target Type	
	NE	E	NE	E	M	C	M	C
Leader 1	80% (4)	20% (1)	50% (1)	50% (1)	60% (3)	40% (2)	50% (1)	50% (1)
Leader 2	80% (4)	20% (1)	80% (4)	20% (1)	60% (3)	40% (2)	60% (3)	40% (2)
Leader 3	75% (6)	25% (2)	55% (6)	45% (5)	50% (4)	50% (4)	64% (7)	35% (4)
Leader 4	63% (5)	37% (3)	50% (4)	50% (4)	63% (5)	37% (3)	50% (4)	50% (4)
Leader 5	56% (5)	44% (4)	54% (7)	46% (6)	56% (5)	44% (4)	75% (9)	25% (3)
Leader 6	77% (10)	23% (3)	68% (13)	32% (6)	33% (4)	62% (8)	44% (8)	56% (10)
Leader 7	47% (8)	53% (9)	64% (16)	36% (9)	18% (3)	82% (14)	40% (10)	60% (15)
Leader 8	67% (18)	33% (9)	68% (19)	32% (9)	48% (13)	53% (14)	43% (12)	57% (16)
Leader 9	68% (15)	32% (7)	69% (24)	31% (11)	60% (12)	40% (8)	59% (19)	41% (13)
Leader 10	68% (19)	32% (9)	56% (10)	44% (8)	33% (9)	67% (18)	24% (4)	76% (13)
Leader 11	70% (7)	30% (3)	53% (9)	47% (8)	67% (6)	33% (3)	71% (12)	39% (5)
Leader 12	72% (41)	28% (16)	72% (28)	28% (11)	14% (8)	86% (49)	21% (8)	79% (30)
Leader 13	0% (0)	100% (4)	75% (3)	25% (1)	0% (0)	100% (4)	25% (1)	75% (3)
Leader 14	20% (1)	80% (4)	43% (3)	57% (4)	60% (3)	40% (2)	86% (6)	14% (1)
Leader 15	50% (4)	50% (4)	100% (1)	0% (0)	63% (5)	37% (3)	100% (1)	0% (0)
Leader 16	50% (1)	50% (1)	50% (3)	50% (3)	0% (0)	100% (2)	50% (3)	50% (3)
Leader 17	100% (2)	0% (0)	-	-	0% (0)	100% (2)	-	-

Note. NE =non-explosives. E = explosives. M = military target. C = civilian target.

The next section presents the results of testing the research questions. Statistics were run on dedicated statistical software SPSS v 28. Significance was set at $\alpha = .050$. Percentages were rounded off to whole numbers and may not add precisely to 100%. Assumptions testing is presented with each research question.

Results

The results section is organized by research questions and accompanying hypotheses. There are three research questions and thus there are three sections below. Each section includes assumption tests, results analyses effect size, and the decision about the null hypothesis.

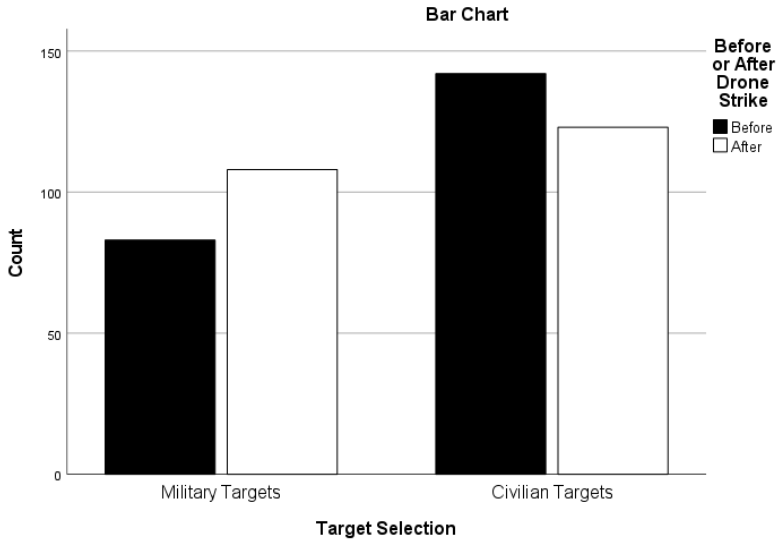
Results for RQ1 - Civilian versus Military Attack Targets

RQ1 was aimed at analyzing the number of attacks against civilian vs. military targets before and after a targeted drone killing of an AQAP HVT. RQ1 was addressed with data from the GTD Target/Victim category. The GTD target/victim type field captures the general type of target/victim in one of 22 categories. In the Yemen database assembled for the current study, the 22 categories of type of target/victim were collapsed into a dichotomous variable created to compare *easier* more accessible civilian targets from *tougher* less accessible military targets for analysis. Specifically, 17 types of targets were designated as easier civilian targets (the following numbers are GTD codes): 1 = Business, 2 = Government (General), 5 = Abortion Related, 8 = Educational Institution, 9 = Food or Water Supply, 10 = Journalists & Media, 11 = Maritime (includes ports and maritime facilities), 12 = Non-Governmental Organization, 13 = Other, 14 = Private Citizens & Property, 15 = Religious Figures/Institutions, 16 = Telecommunication, 17 = Terrorists/Non-State Militias, 18 = Tourists, 19 = Transportation (Other Than Aviation), 21 = Utilities, and 22 = Violent Political Parties. Four GTD categories were designated as tougher military targets (the following numbers are GTD codes): 3 = Police, 4 = Military, 6 = Airports & Aircraft, 7 = Government (Diplomatic). The final GTD category (Unknown) was coded in the Yemen database as missing data. This study rationalized that an increased number of attacks against civilian targets after successful drone strikes may reflect degradation.

Figure 2 illustrates the numbers of civilian and military targets before and after the successful drone strike on an HVT. Before the strike, a third of the targets were military, and two-thirds of the targets were civilian (Table 5). After the strike, the numbers of military and civilian targets were more comparable, indicated by a slight increase in the number of military targets and a slight decrease in the number of civilian targets.

Figure 2

Numbers of Military and Civilian Targets Before and After the Successful Drone Strike on an HVT



To answer RQ1, a 2x2 chi-square test of independence was run because the variables (the successful drone strike on an HVT with the two levels of before or after, and type of target with the two levels of civilian versus military targets) were categorical. The chi-square test of independence is a nonparametric test for comparing the numbers or counts of cases observed to occur in cross-tabulated categories to numbers or counts expected by chance. Because chi tests are nonparametric, the data do not have to be normally distributed. Adjusted residuals ±1.96 reveal significant differences between observed and expected counts. The assumption that must

be met for a valid chi-square test of independence is that none of the expected counts are under five. Table 5 shows that the data met this assumption.

The hypotheses were:

H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the numbers of civilian versus military attack targets.

H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the numbers of civilian versus military attack targets.

Table 5 shows the cross-tabulation. Results of the chi-square test of independence showed that there was a statistically significant difference in the numbers of civilian versus military attack targets before and after the successful drone strike on an HVT ($X^2(1, 456) = 4.16$, $p = .041$). The null hypothesis was rejected. Adjusted residuals showed that, before the drone strikes, there were significantly fewer military targets and significantly more civilian targets than expected by chance. After the drone strikes, however, the pattern changed to significantly more military targets and significantly fewer civilian targets than expected by chance. The effect of the successful drone strike on an HVT was small but statistically significant ($\Phi = .10$, $p = .033$).

Answer to RQ1

The answer to RQ1 was yes. Following the successful drone strike on an AQAP HVT, the number of attacks on military targets increased significantly whereas the number of attacks on civilian targets decreased significantly.

Table 5

Target Selection Before or After Drone Strike Crosstabulation

		Before or After Drone Strike		
Target Selection		Before	After	Total
Military Targets	Count	83	108	191
	Expected Count	94.2	96.8	191.0
	% within Before or After Drone Strike	37%	47%	42%
	Adjusted Residual	-2.1	2.1	
Civilian Targets	Count	142	123	265
	Expected Count	130.8	134.2	265.0
	% within Before or After Drone Strike	63%	53%	58%
	Adjusted Residual	2.1	-2.1	
Total	Count	225	231	456
	Expected Count	225.0	231.0	456.0
	% within Before or After Drone Strike	100%	100%	100%

Results for RQ2 - Method of Attack

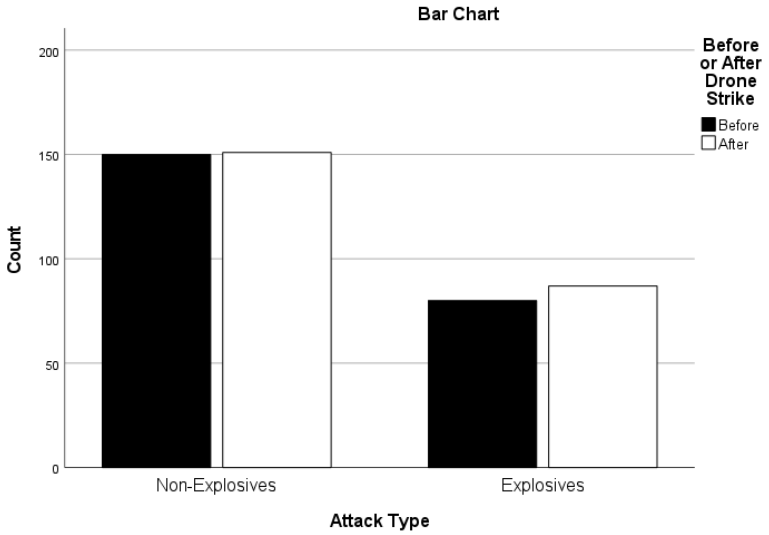
RQ2 aimed to analyze the chosen method of attack (explosive vs non-explosive) before and after a targeted drone killing. This variable was based on the GTD category of Attack Information (Table 2, Chapter 3), which captures 9 categories of general methods of attack. In the Yemen database assembled for the current study, method of attack was examined dichotomously by differentiating attacks using explosives from other methods of attacks (e.g., using firearms). Typically, only one attack type is recorded for each attack in the GTD. However, for attacks that involve multiple incidents, as many as three attack types can be recorded. When multiple attack types apply, the most appropriate value is determined based on the following hierarchy (numbers are GTD codes): 1 = Assassination, 4 = Hijacking, 6 = Kidnapping, 5 = Barricade Attack, 3 = Bombing/Explosion, 2 = Armed Assault: use of firearm, 8 = Unarmed Assault, 7 = Facility/Infrastructure Attack, and 9 = Unknown). All three GTD attack types were searched for the ‘Bombing/Explosion’ code and for multiple attacks. If any of the multiple attacks involved explosives, it was coded as explosive. Seventeen ‘Bombing/Explosion’

entries listed multiple attacks: 13 included armed assault, 2 included facility/infrastructure attacks, and 2 listed explosives as a second type of attack.

Figure 3 illustrates the number of attacks involving explosives and non-explosives before and after the successful drone strike on an HVT. The proportions of attack types before the successful drone strike on an HVT did not change after the strike. Before the strike, two-thirds of the attacks involved non-explosives compared to one-third involving explosives. After the strike, the same two-thirds/one-third proportion emerged.

Figure 3

Number of Attacks involving Non-explosives and Explosives Before and After the Successful Drone Strike on an HVT



However, to answer RQ2, a 2x2 chi-square test of independence was run because the variables (the successful drone strike on an HVT with the two levels of before or after, and attack type with the two levels of non-explosives versus explosives) were categorical. The assumption that must be met for a valid chi-square test of independence is that none of the expected counts are under five. Table 6 shows that the data met this assumption.

The hypotheses were:

H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the explosive vs non-explosive method of attack.

H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the explosive vs non-explosive method of attack.

Table 6 shows the cross-tabulation. Results of the chi-square test of independence showed that there was not a statistically significant difference in the numbers of explosive and non-explosive methods of attack before and after the successful drone strike on an HVT ($X^2(1, 468) = 0.09$, $p = .761$). The null hypothesis was retained. Adjusted residuals indicated that none of the number of attacks differed from what was expected by chance alone. The effect of the successful drone strike on an HVT was negligible and non-significant ($\Phi = .02$, $p = .689$).

Table 6

Attack Type Before or After Drone Strike Crosstabulation

		Before or After Drone Strike		
Attack Type		Before	After	Total
Non-Explosives	Count	150	151	301
	Expected Count	147.9	153.1	301.0
	% within Before or After Drone Strike	65%	63%	64%
	Adjusted Residual	.4	-.4	
Explosives	Count	80	87	167
	Expected Count	82.1	84.9	167.0
	% within Before or After Drone Strike	35%	37%	36%
	Adjusted Residual	-.4	.4	
Total	Count	230	238	468
	Expected Count	230.0	238.0	468.0
	% within Before or After Drone Strike	100%	100%	100%

Answer to RQ2

The answer to RQ2 was no. Attacks involving non-explosives were twice as likely than attacks involving explosives before and after the successful drone strike on an HVT.

Results for RQ3 - Lethality

RQ3 aimed to measure the lethality of attacks before and after a targeted drone killing of an AQAP HVT. Lethality was based on the GTD category, Casualties and Consequences (Table 2, Chapter 3), which includes the number of total confirmed fatalities for the attack and is composed of all of the victims and attackers who died as a direct result of the attack. Where there is evidence of fatalities, but a figure is not reported or it is too vague to be of use, this GTD field remains blank and was coded in this study as missing data. When information regarding the number of victims killed in an attack is missing but the number of perpetrator fatalities is known, this value only reflects the number of perpetrators who died. Similarly, when information regarding the number of perpetrators killed in an attack is missing but the number of victims fatalities is known, this value only reflects the number of victims who died. Where several independent sources report different numbers of casualties, the GTD usually reflects the number given by the most recent source. When there are several "most recent" sources published around the same time, the majority figure was used. Where there is no majority figure among independent sources, the database listed the lowest submitted fatality figure.

Number of Fatalities

The lethality variable in the Yemen database assembled for this study had more missing values than target type or method of attack. Data on fatalities were available on $n = 422$ attacks and unavailable on $n = 46$ attacks. Figure 4 illustrates the distribution of fatalities across attacks. In total, 45% of the attacks did not result in fatalities and another 22% resulted in one fatality only. The remaining third of the attacks involved 2-58 fatalities.

Figure 4

Frequency Distribution of Numbers of Fatalities per Attack

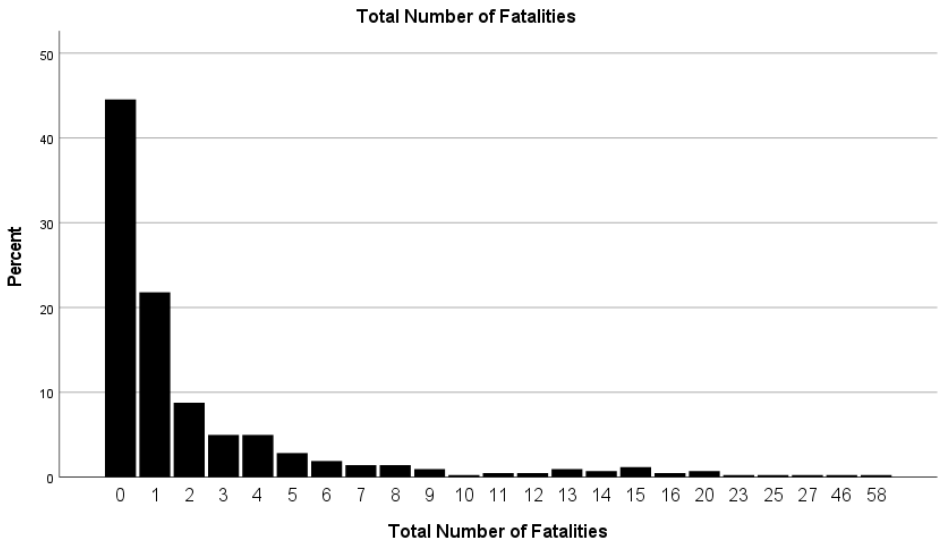
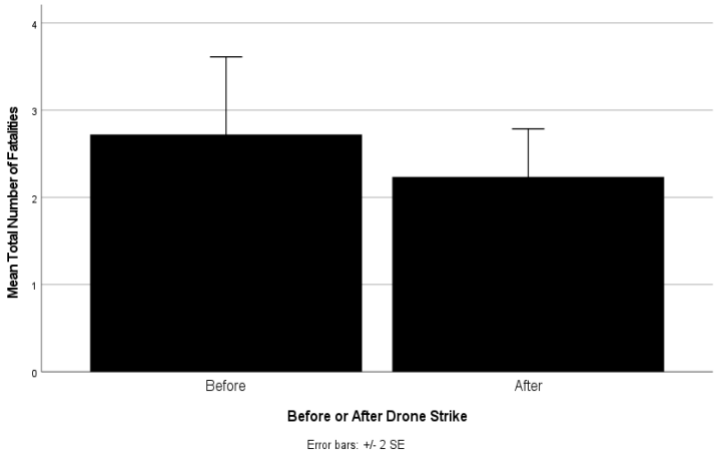


Figure 5 illustrates the fatality means before and after the successful drone strike on an HVT. On average, there were more fatalities before (M = 2.72 fatalities, SD = 6.37, n = 205 attacks) than after (M = 2.24 fatalities, SD = 4.06, n = 217 attacks) the successful drone strike.

Figure 5

Means of Fatalities Before and After the Successful Drone Strike on an HVT



To answer RQ3, a comparison of the fatality means illustrated on Figure 5 was needed to see if the difference was statistically significant. However, the fatality data failed to meet the assumptions needed for valid independent *t-test* results, particularly assumptions of normally distributed data and homogeneity of variances; cf. the strong skew illustrated in Figure 4. The nonparametric alternative to the independent *t-test* is the *Wilcoxon-Mann-Whitney* test, one of the most powerful of the nonparametric tests (Siegel & Castellan Jr., 1988). It is a very useful alternative to the parametric *t*-test when the data fail to meet *t*-test assumptions. It tests whether two groups were drawn from the same population by comparing medians instead of comparing means as in the *t*-test. In the current study, the independent variable was categorical (before or after the successful drone strike on an HVT) and the dependent variables were the number of fatalities and number of persons injured.

The following hypotheses were tested:

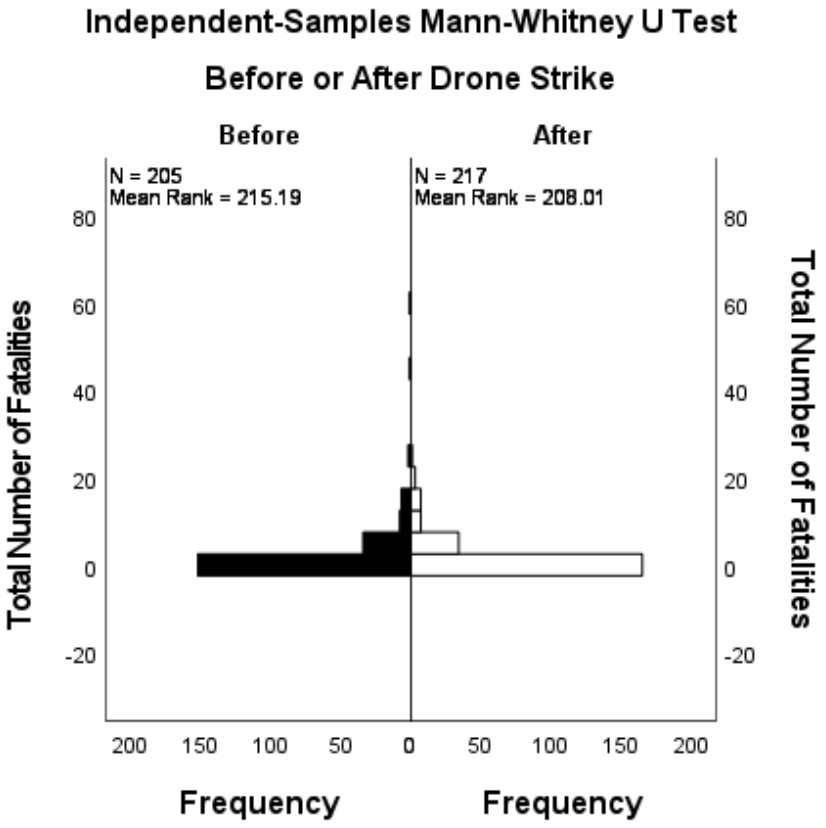
H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of fatalities from terrorist attacks.

H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the total number of fatalities from terrorist attacks.

Results of the *Wilcoxon-Mann-Whitney* test showed that the difference in the median fatalities before and after the successful drone strike on an HVT was not statistically significant ($WMW(422) = 0.64$, $p = .524$). The null hypothesis was retained. The illustration of the comparison of the two sample distributions in Figure 6 shows the similarity of the distributions of the data before and after the successful drone strike on an HVT.

Figure 6

Comparison of the Two-Sample Distributions of Fatalities



Number of Injured Persons

Data on the numbers of persons who sustained non-fatal injuries were available on *n* = 396 attacks and unavailable on *n* = 72 attacks. The distribution of injured persons across attacks, illustrated in Figure 7, shows that 66% of the attacks did not result in injured persons and another 8% resulted in one person being injured. The remaining attacks involved 2-60 injured persons.

Figure 7

Frequency Distribution of Numbers of Persons Injured per Attack

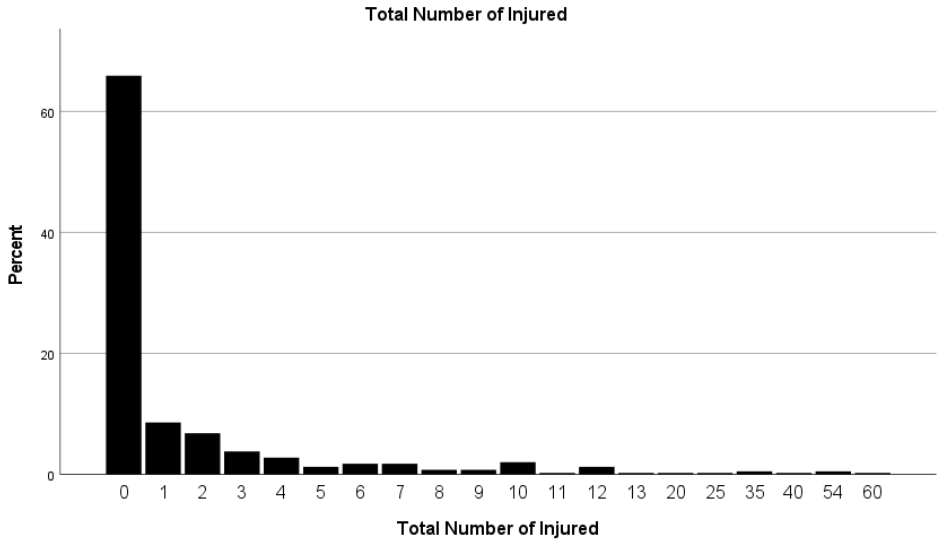
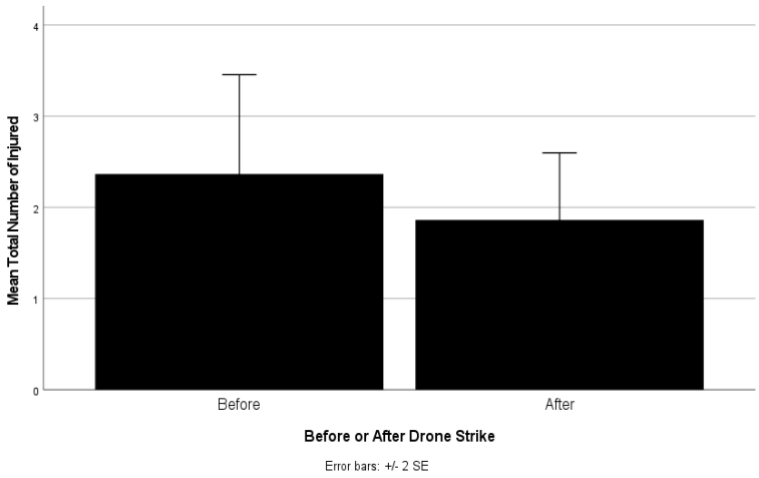


Figure 8 illustrates the means for the number of injured persons before and after the successful drone strike on an HVT. On average, there were more injured persons before (M = 2.37 injured persons, SD = 7.43, n = 186 attacks) than after (M =1.86 injured persons, SD = 5.33, n = 210 attacks).

Figure 8

Means of the Numbers of Injured Persons



To answer RQ3, a comparison of the mean number of injured persons illustrated in Figure 8 was needed to see if the difference was statistically significant. However, as with the fatality data, the number of injured persons data also failed to meet the assumptions needed for valid independent *t*-test results, particularly assumptions of normally distributed data and homogeneity of variances, cf. the skew in Figure 7.

The following hypotheses were tested with a *WMW* test:

H_0: Before and after the successful strike on an AQAP HVT, there is no statistically significant difference in the total number of injured in terrorist attacks.

H_a: Before and after the successful strike on an AQAP HVT, there is a statistically significant difference in the total number of injured in terrorist attacks.

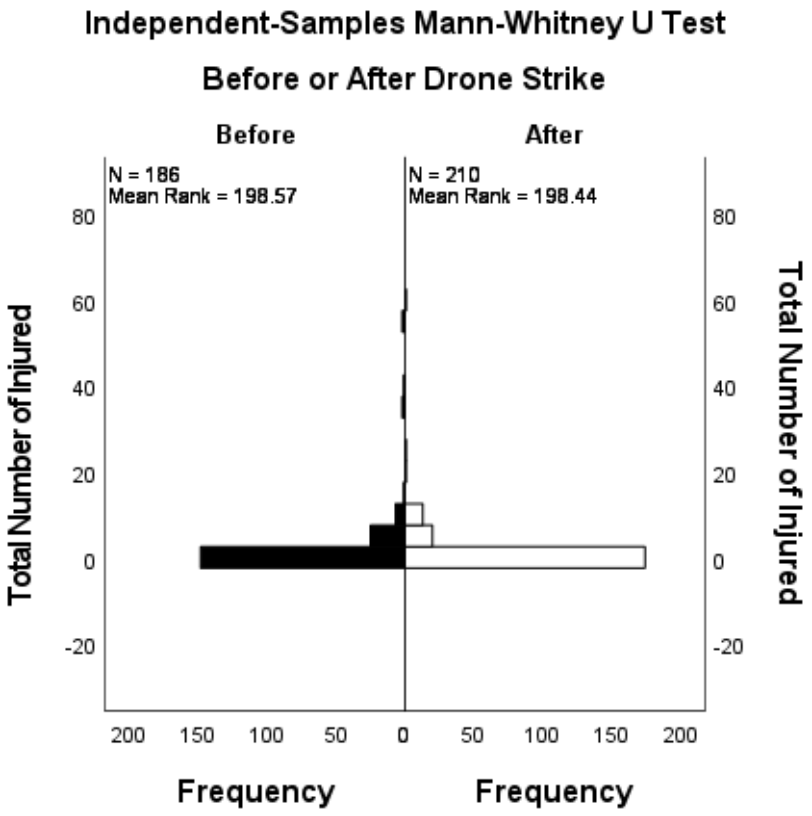
Results of the *Wilcoxon-Mann-Whitney* test showed that the difference in the median numbers of injured persons before and after the successful drone strike on an HVT was not statistically significant (*WMW* (396) = 0.01, $p = .989$). The null hypothesis was retained. The illustration of the comparison of the two sample distributions in Figure 9 shows the similarity of data before and after the successful drone strike on an HVT.

Answer to RQ3

The answer to RQ3 was no. Although the number of fatalities and injured persons was less after the successful drone strike on an HVT, the numbers did not change significantly before and after.

Figure 9

Comparison of the Two Sample Distributions of Numbers of Persons Injured



Chapter 5: Conclusions

Overview

The purpose of Chapter 5 is to provide an effective conclusion to the current study. Therefore, this chapter contains an analysis of the findings presented in Chapter 4. This analysis includes a discussion of the statistical results pertaining to each research question and how those results compare to the existing literature. In addition, this chapter contains a section dedicated to the implications of the learned results. Finally, the limitations of the current study are discussed followed by recommendations for future research regarding the study of targeted drone killings.

Discussion

The purpose of the current study was to analyze the degradation effects of targeted drone killings against the terror group Al-Qaeda in the Arabian Peninsula (AQAP). Therefore, this study quantified degradation by measuring the changes in select characteristics of attacks before and after the targeted drone killing of an AQAP HVT. Specifically, the current study used the dependent variables lethality, method, and target to measure the degradation effects of targeted drone killings. Consequently, these variables acted as the basis for the research questions used in this study. Therefore, the following sections discuss the results of this study through the lens of the research questions and how the findings compared to the existing literature.

RQ1: Target

RQ1 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in attack target (civilian vs. military)?), focused on measuring the change in target selection following a targeted drone killing. This study rationalized that an increased number of attacks on civilian targets following a drone killing would constitute a degradation in professionalism and capability. The results of this study relating to target selection showed a

small, but statistically significant effect. However, rather than show an increase in attacks against civilian targets, the findings revealed an increase in attacks against military targets following a targeted drone killing of an AQAP HVT. Therefore, as rationalized by this study, such a result does not constitute degradation.

The results of the current study pertaining to target selection do not confirm some of the findings in the existing literature. Similar studies revealed evidence of a shift in target selection consistent with degradation. For example, Walsh (2018) concluded that the targeted drone campaign against Al-Qaeda Central (AQC) destabilized the organization's ability to control lower-level members, thus leading to an increase in attacks against civilians. Similarly, Bastug and Guler (2018) assessed that civilians were targeted four times more often after the killing of Al-Qaeda in Iraq (AQI) and ISIS leaders Abu Musab al-Zarqawi, Abu Omar al-Baghdadi, and Abu Bakr al-Baghdadi. Finally, Shire (2020) concluded that the terror organization Al-Shabaab increased attacks against civilians using unsophisticated methods.

RQ2: Method of Attack

RQ2 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in method of attack (explosive vs non-explosive)?), was aimed at determining if there was a change in method of attack before and after a targeted drone killing. Specifically, the current study rationalized that an increase in the number of attacks using non-explosive methods suggests a degradation in professionalism or capability. Unlike RQ1, the results from the method variable were not statistically significant. In other words, the method of attack before and after a targeted drone killing did not change in a meaningful way. The ratio of AQAP attacks using explosives vs. non-explosives remained relatively consistent before and after the targeted killing.

According to the existing literature, there is some discrepancy as to the effects on attack methods following a targeted drone killing. The findings in the current study confirm some existing research while also contradicting other results. For example, a study by Shire (2020) concluded that there was a reduction in suicide bombings following the targeted killing of Al-Shabaab's leader. However, Bolland and Ludvigsen (2018) concluded that targeted drone killings only intermittently degraded the capabilities of AQAP and did not significantly weaken their ability to attack Western targets.

RQ3: Lethality

RQ3 (Following the targeted drone killing of an AQAP HVT, is there a statistically significant change in lethality of attacks?), aimed to analyze the lethality of attacks before and after a targeted drone killing. The current study rationalized that a decrease in attack lethality following a targeted drone killing suggests degradation. Similar to RQ2, the statistical analysis pertaining to RQ3 produced negligible results. In other words, targeted drone killings did not have a significant effect on the lethality of AQAP attacks.

The findings related to RQ3 confirm some results found in the existing literature. For example, Carson (2017) reported negligible effects on attack lethality as a result of targeted drone killings against Al-Qaeda. In addition, a study by Albert (2021) concluded that targeted drone killings against the militant group Boko Haram exacerbated the threat of terrorism rather than reducing it. Similarly, Jaeger and Siddique (2018) reported results consistent with a vengeance effect following targeted drone killings against Taliban leadership. Finally, a study by Shire (2020) concluded that targeted drone killings did not reduce the overall lethality of Al-Shabaab attacks following the targeted killing of the group's leader.

However, while the present study and a significant portion of the existing literature found little evidence of degradation through a loss of lethality following a targeted drone killing, some research reported contradicting results. For example, another study conducted by Carson (2018) produced results that pointed to a decrease in attack lethality following a targeted drone killing. Similarly, Yaoren (2019) concluded that the effects of leadership absence on Hamas and the Abu Sayyaf Group (ASG) resulted in a loss of lethality. Finally, according to Johnston and Sarbahi (2016), targeted drone killings prosecuted against militants in Pakistan resulted in a decline in lethality, albeit for a short time.

Implications

The results of the present study indicate that targeted drone killings against AQAP HVTs produced little effects in terms of degradation. While the measurement of the target selection variable produced statistically significant results, they were in the opposite direction of degradation as rationalized for the current study. The lethality and method variables produced non-significant results. In other words, there was negligible change in AQAP attack methods and lethality following the targeted drone killing of an HVT. However, the findings of this study are useful in terms of contributing to the existing body of literature and necessitate further explanation.

Lethality and Method

First, it is apparent from the statistical outcomes that lethality and method of attack were not significantly altered following the targeted drone killing of an AQAP HVT. Such a result implies that the removal of an HVT did not hinder the organization's ability to carry out lethal attacks using sophisticated methods. Such a result raises questions regarding the idea that terrorism operates as a production line of activity. This theory places great emphasis on the

importance and subsequent removal of highly skilled and intelligent leaders and facilitators who contribute to effective terrorist attacks. However, it is the researcher's view that the negligible results regarding lethality and attack method point to an oversimplification of the hierarchical structure that makes up the production line of activity. In essence, it is conceivable from the results that the production line is much more complex than previously understood.

Rather than rely on a few select individuals to carry out effective terrorist violence, the production line may be made up of multiple members that have the proficiency to continue sophisticated and lethal attacks at a consistent level despite the loss of a head leader or facilitator. In other words, the results of the current study regarding lethality and method call into question the level of redundancy and mentoring built into the production line of activity. It is probable that the continued success of lethal AQAP attacks using sophisticated methods following a targeted drone killing is due to effective redundancy and a robust mentoring program within the production line.

Target Selection

Unlike the negligible results pertaining to the lethality and method variables, there was a statistically significant change in attack target following the targeted drone killing of an AQAP HVT. However, rather than leading to an increase in attacks against civilian targets, the results showed a statistically significant shift toward attacks against military targets. While this result trends in the opposite direction of degradation as rationalized by this study, it does not necessarily constitute a backlash effect, but rather a disciplined and informed response from AQAP.

Frequently, the success of targeted drone killings relies heavily on sophisticated intelligence-gathering operations on the ground. However, such operations usually require

assistance from the local government or military. According to Woods (2015), AQAP is acutely aware of the cooperation between the United States and the Yemeni government to gather intelligence and carry out targeted drone killings. As a result, it is likely that the increase in AQAP attacks against military targets following a targeted drone killing is a direct attempt to disrupt the intelligence gathering that informs the targeted killing campaign in Yemen.

The findings from this study show no evidence that a counterterrorism strategy relying on targeted drone killings is effectively degrading AQAP. It is evident that AQAP has been able to maintain effective operations despite the loss of key leaders and facilitators. It is the researcher's conclusion that such a result is due to effective redundancy and mentorship within the production line of activity. In addition, the lack of operational degradation led to an increase in attacks against military targets, which suggests an attempt to disrupt the targeted killing process, including intelligence gathering. Consequently, the United States should not be overdependent on targeted drone killings.

This conclusion does not suggest that the weaponization of unmanned drones is useless. Undoubtedly, drones such as the MQ-9 Reaper and MQ-1 Predator have proven to be lethally effective when used in conjunction with existing counterterrorism operations on the ground, as in Iraq and Afghanistan during the GWOT. However, it may be beneficial to use targeted drone killings as a part of a comprehensive counterterrorism strategy that systematically dismantles all aspects of a terrorist organization. In other words, the targeted killing of important leaders and facilitators should represent only one segment of the counterterrorism strategy. According to the results of this study, it appears that degradation requires a more complex approach than simply removing HVTs through targeted killings. However, when compared to conventional tactics, it

could be argued that targeted drone killings are the best option to contain terrorism in the modern world (David, 2003).

Limitations

There are two potential limitations that may affect the validity of the present study. First, the data used to conduct the research analysis was collected from the Global Terrorism Database (GTD). The GTD contains extensive information on the characteristics of terrorist attacks around the world. This information includes data points such as the number of deaths or injuries per attack, method of attack, attack target, and the group responsible for an attack. However, to collect this data, the GTD relies on open media sources. Due to the nature of open media sources, it is possible that there could be discrepancies in the reported data. For example, if the number of recorded fatalities from a terrorist attack in Afghanistan was sourced from a local media outlet in Kabul, it is possible that the media outlet was mistaken in the number of fatalities. However, while it is possible that there could be mistakes within the data, the GTD ensures that sources are first deemed credible before their information is added to the dataset. Therefore, the threat to the validity of the present study is minimal.

The second potential limitation is a result of the secretive nature of select targeted drone killings. While many targeted drone killings are public knowledge, it is possible that the United States carries out designated targeted drone killings that are kept a secret from the public due to national security interests. In such a case, the targeted killing would be unknown to the researcher and therefore, unavailable for inclusion in a study. However, the amount of publicly available data is sufficient to conduct effective research.

Recommendations for Future Research

The purpose of the present study was to provide an exploratory research analysis of the data pertaining to the degradation effects of targeted drone killings against the terror group AQAP. As a result, the dependent variables utilized in the current study were broad to allow the data to guide future research. For example, the method of attack variable compared the number of attacks that utilized explosives vs. non-explosives before and after a targeted drone killing. Similarly, the target selection variable only compared attacks against military vs civilian targets before and after a targeted drone killing. However, the GTD contains other variables that could be included in a future study. It is possible that degradation could be found by analyzing more specific dependent variables within the GTD.

Similarly, a future study should analyze the effects of targeted drone killings by examining each killed HVT individually. In other words, rather than grouping the killed HVTs together into one large before and after sample, it may be beneficial to analyze each case individually. Such a research model would potentially reveal certain degradation effects that may be obscured by a broad separation of the killed HVTs. In addition, examining each HVT individually may help to determine which members are more influential or essential to the group's operations, thus aiding future counterterrorism operations.

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