

Predicting Terrorist Targets: Using Data to Enhance National Security

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Section I: Introduction

Counterterrorism efforts in America have become increasingly vital to national security ever since September 11, 2001. Following the attacks, the PATRIOT Act was enacted, and the US government created several agencies devoted to counterterrorism. However, officials were limited to how much they could predict and prevent due to a lack of data and inferior surveillance technology. By the mid- 2000's, technology had improved drastically, and researchers finally began consolidating data and studying terrorism in a more quantitative manner. From looking at research, there is a known connection between a group's ideology and their target. If there is surveillance on the perpetrators, there is a better chance of preventing attacks. Researchers are uncovering relationships based on a group's ideological goals, structure, and who their membership base is, with where they attack. Having a legitimate comprehensive database such as the American Terrorism Study to encourage research on terrorism is vital in giving the US a chance to stop all types of terror attacks. Surveillance, as it pertains to national security, is always a hotly debated topic. This paper will not detail the ethics behind surveillance, but more acknowledging its potential benefits when it comes to deterring crime and preventing terrorist attacks.

Based on an organization's ideology, there are similarities between who and where they attack, and how they do so. There are also known similarities that exist between organizations such as the types of weapons most likely to be used in an attack, targets, and fatalities. For example, DeLeeuw and Pridemore (2018) find that "Right-wing perpetrators have employed attack types that are likely to inflict harm against individuals or locations that they frequent" typically meaning armed assaults, explosions, and infrastructure attacks. There are differences that can be used to analysts' advantage to help predict targets based on the group's ideology, among other factors.

Another topic to consider is the planning and preparatory activities that organizations will take part in. There are plenty of instances where the groups plan very close to their sites and commit crimes before the big hit even happens. In the Smith et al. study, "The initial "planning phase" appeared to last, on average, between twelve days and approximately two months. It is during this period that law enforcement agencies would have the greatest probability of successful intervention." A goal is that in knowing where these meetings are taking place, officials can intervene before the major attack even takes place. There is also a relatively established planning timeline that groups utilize, and being aware of this can help prevent their goal from happening.

There are links between an individual's rank within the group and their demographic information; with what crimes they commit. In some groups, it is the newer recruits with something to prove that carry out the attacks, whereas in others, the seniors who do most of the planning and end up getting indicted (Ratcliff, 2016). This knowledge can help researchers better understand the role and individual plays within the organization.

I use a data set from the American Terrorism Study (1980-2002). There is a surprising amount of public data available for research purposes. However, more specific identifiers are masked from my version of the document.

I will only look at terrorist attacks that take place in the USA. Since “lone wolf” terrorists are acting alone, they are very difficult to study and predict, so I will only look at the cases that have an ideology linked to the perpetrator. This is a suggested topic for future research.

This paper will center around this question: How can researchers use data on demographic information for perpetrators, group ideology, role in group, and other personal characteristics to predict where a terrorist attack will occur? I will examine if the data can give researchers meaningful information on potential terrorist attack sites based on an organization's ideology, membership/rank structure, and the individual characteristics of members. This analysis, if valid, coupled with adequate surveillance, can prevent terrorist attacks on American soil.

Section II: Literature Review

Terrorists

Terrorists are typically quite different from regular criminals. According to Smith et al. (2008), they tend to be from middle- and upper-class backgrounds and higher education level than the conventional criminal population. Left- wing members tend to be the most privileged, and also the most educated. However, Ratcliff and Shields (2016) claim that they have relatively low educational attainment. I think this difference is due to the sources looking at data on groups with varying ideologies. Terrorists also tend to be older, meaning that this is more of a long-term career choice. Terrorists on the right, particularly among the leadership, reflect an aging population whose members grew up prior to the civil rights movement in America. Some of the biggest indicators of motivations and outcomes are the ideologies that the terrorist organization represents.

The sources break down the types of terror groups in similar ways. DeLeeuw and Pridemore (2018) divide among Right-wing, left-wing, nationalist/separatist, and single issue

domestic terrorist groups. Another study lists far-left, Al Qaeda (AQ) and affiliates, and far-right as their main categories (Ratcliff and Shields 2016). In the USA, the public tends to know more about right-wing terror groups and international ones, since they are the most active and violent.

Recruiting

Typically, individuals join terrorist groups with little to no “radical” ideas. Through radicalization, violence is now seen as necessary and legitimate. A key component of the process is the formation of a radical identity (Ratcliff and Shields 2016). The other journals that I look at do not care as much about identity or social group theories, but more the data and how to prevent attacks based on data alone. The main takeaway from “Examining Terrorist Pre-Affirmation Behaviors” is that the radicalization process is predictable and there can be an “ideal” recruit that groups go after.

Criminological theories of terrorism

LaFree and Dugan (2009) look at ways to deter terrorist activities through theory, similar to the Ratcliff and Shields (2016) These are important contributions despite focusing mainly on theory and not data. They examine internal and external rewards that terrorists gain from attacks, which has potential to inform policies that could work to slow recruitment.

Another perspective brought up by LaFree and Dugan (2009) is the strain perspective, which is that if people think they are being oppressed they are more likely to lash out with terrorism. This journal examines perspectives that are potentially applicable to US policy. The source "Research on Terrorism and Countering Terrorism" reiterates this point. A (2008) study of “terrorist Islamic groups finds that 60 percent of subjects joined a terrorist organization while living in a country in which they did not grow up, and another 20 percent were second- or third-generation offspring of Muslim immigrants to Western countries”. There must be motivated individuals, targets, and a lack of guardians against the crimes (LaFree and Dugan 2009).

Methods for data collection and Research

Data collection for terrorism can be complicated. Researchers must see if enough information can be obtained from open source materials to address their research questions. Given that, will the information reveal patterns of conduct that might be useful for law enforcement? (Smith et al. 2008) All of the sources echo concerns like this. Data alone is not enough, but with surveillance

there is potential for intervention, which is still better than having nothing to draw from.

Currently, the only open-source worldwide terrorist event database collecting both transnational and domestic terrorism data for an extended period of time is the GTD- which was used in one of the analyses (LaFree et al. 2009). Several of the journals utilize The American Terrorism Study, which is a compilation of data from federal courts of terrorist cases for the period 1980-present (Ratcliff and Shields 2016). Since terrorism constantly changes, one concern that I have from looking at the sources is that the data that most of the sources utilized was from 1970- 2006.

Preparatory Activities

Terrorists take part in criminal activity before they commit their major attacks. These take place in locations such as the terrorists' residence or home base and occur in measurable time and space (Smith et al. 2008). Knowing this, researchers can identify patterns of activity. The "Time and Space" analysis reveals that the ratio of criminal to non-criminal activity is almost evenly divided (47% to 54%). Right-wing terrorists engage in more preparatory criminal behaviors overall than international terrorists. This is surprising, since it is international terrorists that plan for longer, but the right-wing groups that commit more crimes in preparation. Hopefully those attacks requiring extensive preparation are more likely to be stopped (Smith et al. 2008).

Among the groups listed in the GATA (Global Anti-Terrorism Assistance) database, it appears that "the initial "planning phase" appeared to last, on average, between twelve days and approximately two months" (ibid. 2008). There is variation among the different types of groups as far as order of planning events and how long they do that for. Overall, Smith et al. (2008) find that "55% of the preparation and planning for terrorism incidents occurred within three months of the incident". LaFree et al. (2009) find that most terrorists choose targets close to their homes, but the ones far away tend to be more deadly. The journals that look at the spatial relationship between groups and targets had access to the locations of terrorist homes, meeting places, and actual targets. This paper will not be looking into preparatory activities, due to masked data from the dataset.

Ideology and Outcomes

Ideology is a critical factor in understanding target prediction, since "attacks are analyzed not as ends in themselves, but as the outcome of efforts to maintain the integrity of the terrorist organization" (Smith et al. 2008). DeLeeuw and Pridemore (2018), add that ideology informs

targets and if the use of violence is acceptable. They also find that, “similar perpetrator types will select similar targets, employ like attack types, and use comparable weapons”. However, since this source looks at the UK, Ireland, and USA, are the types of terrorist groups are really comparable? Al-Qaeda hates America much more than it does Ireland, for example. The journal sees that right-wing perpetrators tend to be more violent; often utilizing armed assaults, bombing/explosion attacks, and facility/infrastructure attacks. Their findings do tend to agree with literature on US groups, however, so I include this in my literature review.

Interestingly, they find that leftwing, anarchists, and environmental focused groups were much less likely to aim for casualties than groups with religious ideologies. Left-wing terrorists are often concerned with political change, so they tend to focus their attacks on the government or government facilities. (DeLeeuw and Pridemore 2018).

According to “Terror Targets in the West: Where and Why” (2016), International groups are likely to go after airplanes, public spaces, government/military structures, and transportation infrastructure. This is due to their “disregard for civilian life, their desire to seek revenge for Western military intervention, and their motivation to economically weaken the target country.”

Membership/rank and Crimes

The more established a terrorist group is, the more likely its targets will reflect a concern for maintaining the group and its structure (Smith et al. 2008). In their analysis, Ratcliff and Shields (2016) “found that while “rank in group” was significantly related to outcomes, some far-right organizations left active participation in the commission of terrorism incidents to subordinate members. Depending on the group, they will have varying roles. Leadership roles provide more opportunities, especially since such roles offer new perks and expectations than for newer members. This same journal finds that leaders of terrorist groups were found to commit more preparatory criminal acts than subordinate members. In many cases, “leadership roles were also tied to commission of such violent acts, as promotions were often contingent on completed terrorist acts” (Ratcliff and Shields 2016). The other sources do not really mention membership and rank in the group like this one does. But if we want to look at the role an individual plays in an attack, this could help.

Solutions

There is no one solution for preventing terrorism. A 2019 DHS report writes that domestic terror groups tend to be spontaneous in ways that limit the potential for police intervention. Additionally, without surveillance, data on potential targets is essentially useless. A suggestion proposed by one of the sources is legitimacy to deter terrorism. Individuals are more likely to obey laws when those laws, and the legal authorities executing them, are perceived to be legitimate. The source also mentions negotiating with terror groups (LaFree and Dugan 2009). However, that is something that most countries are explicitly against. Since terrorists frequently rely on the response of governments to mobilize supporters, authorities must consider this when deciding responses to terror attacks. A suggestion for future research is one that considers the effects of surveillance & using historical data on preventing terrorism.

Section III: Empirical Methodology

All of the variables come from the American Terrorism Study dataset that I trimmed down. They are almost all qualitative, with numbers separating them making it possible to produce frequency tables and run regressions. The years range from 1970-2002. I do not have summary statistics for any of my dependent variables, as they are all qualitative. For frequencies, see the Data Appendix.

There are no dummy variables now- I will have to create them to run the regressions. Since the variables can have up to a dozen or more categories, the dummies will change based on what specifically I am testing. For example, to compare international terror groups to domestic ones, I will designate domestic = 1, and international = 0 to see the differences between the two. Other examples of dummies include race, gender, education, marital status, and role in group. Below are the important categorical variables for my regressions.

Actual Target- the actual type of site that the incident occurred. This is blank, missing, or not applicable for 80 values, but will be one of my dependent variables. No target was hit in 154 cases, and the overall n=574.

Actual Target	Frequency	Percent
Banks	99	17.25
Armored car- casino or bank	51	8.89
Other government facility, embassy	26	4.53
Airliner	40	6.97
Weapons retailer	21	3.66
Terrorist group affiliate	28	4.88
Military Bases	20	3.48
Office Building	26	4.53
None hit	154	26.83

Intended target- where the individual planned to attack. n=574 with 150 missing values. I will only use “no intended target” since it shows up the most.

Intended Target	Frequency	Percent
Federal law enforcement	33	5.75
Other government personnel, judge	64	11.15
Other government facility, embassy	32	5.57
Airliner	40	6.97
No intended target	74	12.89
Terrorist group affiliate	23	4.01
Dept. of State- Fraud	21	3.66

Group Type	Frequency	Percent
Left-Wing	118	20.56
Right-Wing	220	38.33
International	200	34.84
Environmental	13	2.26
Single-Issue	2	.35

Group type (ideology)- what type of group carried out the specific attack. Specifically, what is their general ideology. n=574, and there are 5 “missing” or unknown values.

Role: the role of the person in their organization. n=574, with 48 blank values. A majority of the cases involved a person designated as “other subordinate”. Following that was “leader”.

Role in group	Frequency	Percent
Other subordinate	298	51.92
Leader	102	17.77
Other/Unknown	11	1.92
Other leader	52	9.06
Member (tech skills or admin)	30	5.23
Non-member	17	2.96

Race	Frequency	Percent
White	407	70.91
Black	60	10.45
White Hispanic	77	13.41
Other	7	1.22

RACE: a categorical variable that only includes white, black, white Hispanic, and other. This is a limitation just in it not being very specific at all. n=574, there are 23 missing values.

EDUC: Highest level of education attained by the offender. n=574, and there are 207 missing values. I am surprised at the number of college and post graduate offenders. This shows that terrorists can be more educated than traditional criminals.

Education	Frequency	Percent
Completed 8 th grade	18	3.13
GED	32	5.57
High School Diploma	67	11.67
Some college/ vocational degree	109	18.99
Associates deg/vocation	9	1.57
College graduate	65	11.32
Post graduate work	24	4.18

Below are the only two purely quantitative variables I have. Both are discrete.

	MEAN	MEDIAN	MIN	MAX	SD	25 TH %ILE	75 TH %ILE
TOT INDICT	1.29	1	1	5	.692	1	1

Total indictments- the total number of indictments a person has at the time of their trial.

	<i>N</i>	<i>Missing</i>	<i>Min</i>	<i>Max</i>	<i>Median</i>	<i>Mean</i>	<i>SD</i>	<i>25th %ile</i>	<i>75th %ile</i>
LEN_MEMB	574	403	2	98	34	52.27	37.47	24	98

Length of membership in months- how long the individual was a member of the group. This is blank roughly 70% of the time, but it can be a factor in what type of crimes an individual commits.

Regressions

Since my variables are almost exclusively qualitative, I will be using odds ratios for various outcomes, depending on the model. I will change my variables to dummies based on what I will be testing. So, for different regressions, the 1 and 0 could be different values. But this will be labeled to prevent any confusion between models. The negative sign in the equations refers to a probability that y= 1 being less if x=1, than if x = 0.

1. Actual Target = Length of membership + Ideology + Sex - Education + Race - Marital + Total Indictments + Role - Age

Race- white=1, so if white they are more likely to attack a bank

Sex- male = 1, so if male, they are more likely to attack a bank

Ideology- Domestic = 1, so if domestic, they are more likely to attack a bank

Length of membership- as the length increases, they are more likely to attack a bank

Education- College = 1, so with higher ed, less likely to attack a bank

Marital- married=1, so if married less likely to attack a bank

Total Indictments- As indictments increase, more likely to attack a bank

Role- Other subordinate = 1, if a subordinate, more likely to attack a bank

Age: over 35=1, if older than 35, less likely to attack a bank

Target- **bank = 1**

2. Actual Target = Length of membership + Ideology + Sex - Education + Marital + Race + Total Indictments + Role + Age

Race- white=1, so if white, more likely to attack weapons retailer

Sex- male = 1, so if male, more likely to attack weapons retailer

Ideology- Domestic = 1, so if domestic, more likely to attack weapons retailer

Length of membership- as the length increases, more likely to attack weapons retailer

Education- College = 1, less likely to attack weapons retailer

Marital- married=1, so if married more likely to attack a weapons retailer

Total Indictments- As indictments increase, more likely to attack weapons retailer

Role- Other subordinate = 1, if a subordinate, more likely to attack a weapons retailer

Age: over 35=1, if older than 35, more likely to attack a weapons retailer

Target- **weapons retailer = 1**

3. Intended Target= -Length of membership - Ideology - Sex + Education - Married + Race
- Total Indictments – Role - Age

Race- white=1, so if white they are more likely to have no intended site

Sex- male = 1, so if female, they are more likely to have no intended site

Education- College = 1, so if they graduate college they are more likely to have no intended site

Marital- married=1, so if married, less likely to have no intended site

Ideology- Domestic = 1, so if domestic, they are less likely to have no intended site

Length of membership- as the length increases, they are less likely to have no intended site

Total Indictments- As indictments increase, they will be less likely to not have an intended site

Role- Other subordinate = 1, if a subordinate, less likely to not have an intended site

Age: over 35=1, if older than 35, more likely to not have an intended site

Target- **none intended = 1**

4. Actual Target = Length of membership + Ideology + Sex - Education + Race - Marital + Total
Indictments + Role - Age

Race- white=1, so if white they are more likely to attack a government facility

Sex- male = 1, so if male, they are more likely to attack a government facility

Ideology- Domestic = 1, so if domestic, they are more likely to attack a government facility

Length of membership- as the length increases, more likely to attack a government facility

Education- College = 1, so with higher education, less likely to attack a government facility

Marital- married=1, so if married less likely to attack a government facility

Total Indictments- As indictments increase, more likely to attack a government facility

Role- Other subordinate = 1, if a subordinate, more likely to attack a government facility

Age: over 35=1, if older than 35, less likely to attack a government facility

Target- **government facility or military base = 1**

I will also look at margins at averages. My predictions are:

1. Age between 26-35 years will have the highest probabilities of carrying out an attack in all four models, when compared to the other age ranges.
2. Role of “other subordinate” will highest probability of carrying out an attack in all models where there **is** an actual target.
3. Race: white will have the highest likelihoods for all outcomes among races.
4. Education: college graduate probability of carrying out an attack will be lower than high school or some college in all models.

Section IV: Results

Odds Ratios for Regression Models

Since a majority of my variables are qualitative, I use odds ratios to examine the probabilities of a certain outcome. The ratio is odds of the target examined in the particular model happening in the presence of whichever independent variable (IV=1), divided by that same outcome given that the IV = 0. A probability greater than 1 indicates an increased likelihood if the independent variable = 1, and if it is less than 1, that is a lower likelihood.

Regression 3: Variables Influencing Intended Target = None Intended

This model looks at the probabilities that there was no intended target, based on the characteristics in the model. Only values in the last two models are significant; college graduate dummy, married dummy, and age over 35 years dummy. The odds are increased if the person is college educated, and they are decreased if the person is married, *ceteris paribus*. Also, being

over 35 years lowers the odds compared to someone who is under 35 years. Race predicts the outcome perfectly, so it is omitted. Only white people carried out this type of attack, which is somewhat surprising given a larger dataset. The n decreases by about 20% from model 1 to model 9 due to missing values.

Intended target	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Group Type: International =1	0.979 (-0.12)	1.080 (0.42)	1.101 (0.51)	1.239 (0.91)	1.251 (0.92)	1.055 (0.22)	1.024 (0.09)	1.050 (0.17)	1.062 (0.19)
Length of membership		0.990 (-1.39)	0.992 (-1.36)	0.993 (-1.02)	0.993 (-1.02)	0.994 (-0.83)	0.993 (-0.99)	1.000 (0.05)	1.011 (1.07)
Role: other subordinate = 1			1.388 (1.23)	1.458 (1.37)	1.408 (1.21)	1.364 (1.08)	1.254 (0.67)	0.716 (-0.60)	0.772 (-0.43)
Race: white=1				1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)
Sex: male=1					0.885 (-0.34)	0.956 (-0.10)	0.972 (-0.06)	1.224 (0.32)	1.312 (0.44)
Education: college grad=1						2.011 (1.80)	2.120 (1.82)	2.912* (2.13)	3.639* (2.25)
Total Indictments							0.904 (-0.61)	1.125 (0.68)	1.324 (1.50)
Marital: married =1								0.128** (-3.17)	0.104** (-2.83)
Age: over 35 = 1									0.340** (-2.62)
n	107	107	107	85	85	85	85	85	85

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

Regression 1: Variables Influencing Actual Target = Bank

Actual target	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Group Type: International =1	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)
Length of membership	0.992 (-2.10)	0.993 (-1.80)	0.996 (-0.93)	0.996 (-0.94)	0.995 (-1.10)	0.995 (-1.02)	0.994 (-1.11)	0.992 (-1.45)
Role: other subordinate = 1		1.224 (0.69)	1.220 (0.66)	1.210 (0.61)	1.242 (0.70)	1.647 (1.50)	1.721 (1.55)	1.882 (1.65)
Race: white=1			2.842 (1.80)	2.823 (1.78)	2.596 (1.64)	1.752 (0.89)	1.713 (0.85)	1.488 (0.62)
Sex: male=1				0.964 (-0.10)	0.950 (-0.13)	0.836 (-0.45)	0.841 (-0.43)	0.859 (-0.37)
Education: college =1					0.569 (-1.55)	0.468 (-1.91)	0.467 (-1.92)	0.410* (-2.30)
Total Indictments						1.413 (2.80)	1.410 (2.77)	1.386 (2.52)
Marital: married =1							1.191 (0.46)	1.246 (0.57)
Age: > 35 = 1								1.614 (1.38)
N	88	88	88	88	88	88	88	88

Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001

This regression looks at the odds that the outcome will be a bank. Here, the only significant variable is education. Education is not significant until I add in age in the final model. If the person graduated college, they are less likely to target a bank compared to someone who has not, *ceteris paribus*. Group type is omitted since it predicted the outcome every time, which is surprising since given that typically banks are a target for any type of criminal, domestic terrorist or not. In all cases, it was an international group that carried out the attack. The n stays at 88 for all eight models.

Regression 4- Variables influencing: Actual Target = Weapons Retailers

For this next regression, group type, role, race, sex, and education all predicted failure, so they are excluded from the model. Marital status and education are the two significant coefficients. If someone is married, there is less of a chance that they would target weapons retailers compared to someone who is not married. For age, there is a higher chance that someone over 35 would target weapons retailers compared to a person who is under 35 years. This surprises me since it is typically younger people who do the “groundwork” for criminal groups.

TABLE 4 Odds table for reg. 4: Variables influencing: Actual Target = weapons retailers			
Actual target	Model 1	Model 2	Model 3
Total Indictments	0.986 (-0.07)	1.126 (0.61)	0.953 (-0.23)
Marital: married =1		0.345* (-2.32)	0.287* (-2.40)
Age: over 35 = 1			2.868* (2.13)
n	36	36	36
Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001			

Regression 2: Variables Influencing Actual Target = government facility or military base

Both role and sex predict the outcome perfectly, so they are excluded from the model. It was only males who were “other subordinates” that targeted a government facility or military base. In all the models, there is an increased likelihood of an international group targeting a government facility or military base compared to a domestic one. Marital is highly significant, showing that individuals who are married target this place at a much higher probability than those who are not married. The n decreases by nearly 50% throughout the 9 models. This is due to a significant amount of missing values which effects the significance of other variables.

TABLE 2 Odds table for reg. 2: Variables influencing Actual Target=government facility or military base									
Actual target	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Group: International =1	1.630*** (3.63)	1.604** (3.15)	1.717** (3.08)	1.752** (2.89)	1.697** (2.75)	1.641** (2.65)	3.674*** (6.03)	36.22*** (5.85)	35.73*** (5.44)
Length of membership		1.023 (3.37)	1.025 (2.73)	1.030 (1.91)	1.029 (2.03)	1.018 (1.93)	1.074 (2.48)	1.115 (5.71)	1.117 (5.80)
Role: other subordinate = 1			1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)	1 (.)
Race: white=1				0.534 (-1.11)	0.591 (-0.95)	0.373 (-1.88)	0.359 (-1.70)	0.214* (-2.05)	0.220* (-1.99)
Sex: male=1					1 (.)	1 (.)	1 (.)	1 (.)	1 (.)
Education: college grad=1						4.523* (2.23)	3.460 (1.60)	3.797 (1.47)	3.795 (1.48)
Total Indictments							0.033 (-3.66)	0.000 (-5.19)	0.000 (-4.51)
Marital: married =1								321.4*** (8.21)	331.3*** (7.40)
Age: over 35 = 1									0.819 (-0.22)
n	109	109	59	59	53	53	53	53	53
Standard errors in parentheses * p<0.05, ** p<0.01, *** p<0.001									

Marginal Effects at Averages

In every model, I hold total indictments and membership length at their averages. This section calculates probabilities of the Y = 1 outcome, sorting by group type and either race, role, age, or education level.

Regression 1: Variables influencing Actual target = Bank

Race: Here the probability of y = 1 is: 65.76 % for those who are white in a left-wing group, *ceteris paribus*. For right wing groups it is 39.99%, *ceteris paribus*. Only white people targeted banks.

Role: The probability of actual target: bank = 1 for left and right wing leaders was around 13-14%, *ceteris paribus*. Both groups saw a higher probability if the person was an “other subordinate”.

Age: The probability of actual target: Bank = 1 is: 40.35% among those who are 26-35 years and in a left wing group, *ceteris paribus*. For right wing groups the number is 37.38%, all other factors constant. It appears that members who were between 46 and 55 years had the highest probabilities in both groups, *ceteris paribus*.

Education: The probability of actual target:bank = 1 for those who did not complete high school and are in a left-wing group, is the highest at 72%, *ceteris paribus*. This number is about the same

for right wing members who did not graduate high school, all other factors equal. The likelihoods decrease as education increases.

Regression 2: Variables influencing Actual Target = Government Facility or Military Base

Race: Only white or hispanic men attacked a government facility. The probabilities are both approximately 43% for international group members who are white or hispanic, *ceteris paribus*.

Role: I can only interpret the probability for Left-wing leaders (20.9%) and International leaders (62.6%), *ceteris paribus*. All other roles were insignificant. It is interesting to note the difference between groups. This indicates differences in roles of members among ideologies.

Age: Only international groups had significant coefficients here, with the probability of actual target: government facility or military base = 1 is: 41.86% among those who are 26-35 years in an international group, *ceteris paribus*. For those 36-45 years in an international group, their probability for $y=1$ is 41.6%, all other things equal.

Education: The probability that actual target: government facility = 1 is: 72% among those who completed some high school and are in a left-wing group, *ceteris paribus*. The probability is similar (71%) for right-wing groups with the same education level when I hold all other factors constant.

Regression 3: Not Included due to Insignificant Values

Regression 4: Variables Influencing: Actual Target = Weapons Retailers

Role: Only “other subordinates” committed this attack type in the sample.

Education: The probability of actual target: weapons retailer = 1 is 82.08% among those who completed some college in an international group, *ceteris paribus*. Apparently only white males in international groups targeted weapons retailers. This probability was surprisingly lower (63%-73%) for less educated offenders, all other factors constant. No one who completed college or a doctorate program committed this crime.

Age: The probability of actual target: weapons retailer = 1 is: 84.33% among those who are 26-35 years in an international group, *ceteris paribus*. The two other age groups had lower probabilities.

Notable observations: I find it interesting that it tends to be leaders who attack government facilities, and other subordinates who go after banks and weapons retailers. This could be because

there is a greater need for planning when going after a government target compared to a regular target. Another finding is that the older members tend to be the ones attacking banks, whereas for government facilities or weapons retailers, attackers tend to be in the 26-35 year range. It is mostly white men who carried out these attacks, from any ideology. Offenders with some high school experience were more likely to attack bank or government facility, and those with some college experience went after weapons retailers. I am not sure how to interpret this- since they could be attacking a weapons retailer to protest weapon sales, or just to steal weapons for their actual attack.

Section V: Discussion and Conclusions

Regression 1: Variables influencing Actual target = Bank

From this model, I learn that if the person graduated college, they are less likely to target a bank compared to someone who has not. This makes sense, since terrorists in non-Left wing groups tend to have lower educational attainment (Ratcliff and Shields 2016). In this model, only international groups carried out the attack. This is surprising, since from the literature, it indicated that international groups would go after other more symbolic targets aimed at instilling fear in the public (“Terror Targets in the West: Where and Why” 2016). Domestic groups would be more likely to just go after money like typical criminals, I thought. The education part is not surprising, since the more educated members are probably more likely to be planning attacks and not carrying them out. That way, in some cases they may not even be the ones who get caught.

Regression 2: Variables influencing Actual Target = government facility or military base

In this model, both role and sex predict the outcome perfectly, so they are excluded. Only males who were “other subordinates” targeted a government facility or military base. In all models, there is an increased likelihood of an international group targeting a government facility compared to a domestic one. This makes sense since an international group is more likely to have an issue with the US government than a domestic group (“Terror Targets in the West: Where and Why” 2016). Marital status is significant, showing that individuals who are married target this place at a much higher probability than those who are not married. This is surprising, and indicates that these are “career criminals” who continue to take part in terrorist activities despite being married.

Regression 3: Variables influencing Intended target = none Intended

This model looks at the probabilities that there was no intended target. Only values in the last two models are significant; college graduate dummy, married dummy, and age over 35 years dummy. The odds are increased if the person is college educated, whereas they are decreased if the person is married, *ceteris paribus*. This makes sense intuitively since one would assume that a college educated individual is not looking to actually harm anyone, they just want to send a message. But, it is also a little surprising since one may assume the college graduate would be a better planner and actually have an idea of a place to target for a more significant impact. Being over 35 years lowers the odds compared to someone who is under 35 years. This makes sense from the literature review, since as people age, they are less likely to want to partake in on the ground, front lines criminal activity (Smith, 2008). The race being white predicts the outcome perfectly so it was omitted. This means only white individuals had no intended target here, which is surprising, but not as much when you remember that the dataset is about 71% white people.

Regression 4- Variables influencing: Actual Target = weapons retailers

For this regression, group type, role, race, sex, and education all predicted failure, so they are excluded. Marital status and age are the two significant coefficients. If someone is married, there is less of a chance that they would target weapons retailers compared to someone who is not married. This makes sense, since typically with marriage and increased commitments, people commit fewer crimes. For age, there is a higher chance that someone over 35 would target weapons retailers compared to a person who is under 35 years, *ceteris paribus*. This may indicate that they are more experienced and calculating this with something bigger in mind later on (Smith 2008).

Limitations

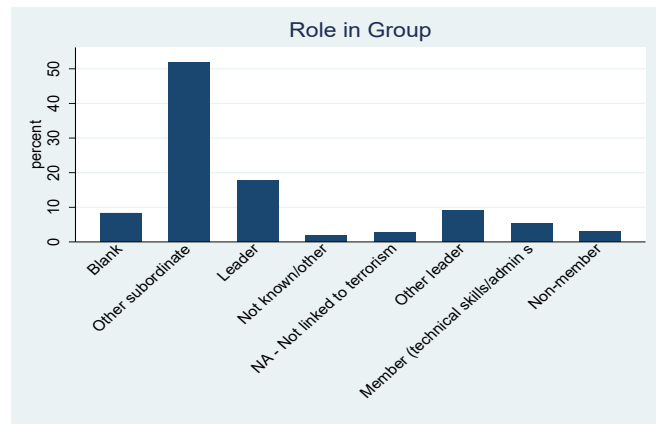
In my dataset, certain variables are masked, such as the name of the group or the individual, actual count numbers, and any other unique identifiers. I also have a relatively small dataset to work with. This source is older, which makes sense since I know that it can take a long time for terrorist cases to have documentable legal outcomes. The issue could be how relevant are data on terror groups from the 1970's and 80's? Since technology plays such an important role in both terrorism and counter-terrorism measures, this time period may not be as relevant now.

Conclusion

After reading the existing literature on the topic of domestic terrorism patterns & preventative strategies, I believe that there is a relationship between group characteristics and outcomes that should be studied further. By looking at what various ideologies tend to attack, researchers can get a better understanding of what the groups are after. In many cases, these are not random attacks. They are planned out and purposeful; designed to have the maximum impact on whoever they are targeting. By understanding the individual characteristics of perpetrators, one can begin to find the similarities in motivations and outcomes. The hope of doing a project like this is to show that by using data, authorities can have better chances at preventing terrorist attacks before they even happen. As far as policy, I encourage continuing surveillance for individuals that are known to be affiliated with a terrorist group. Using data for predicting terrorist outcomes has the potential to be increasingly integral to counter-terrorism efforts, provided that we continue to collect and analyze the data. This research, along with surveillance can positively impact US security at home.

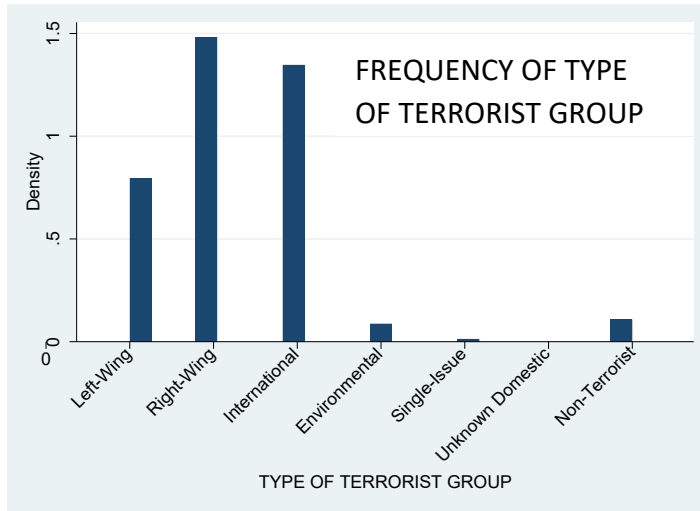
Data Appendix

ROLE: the role of the person in their organization. n=574, with 48 blank values. A majority of the cases involved a person designated as “other subordinate”.



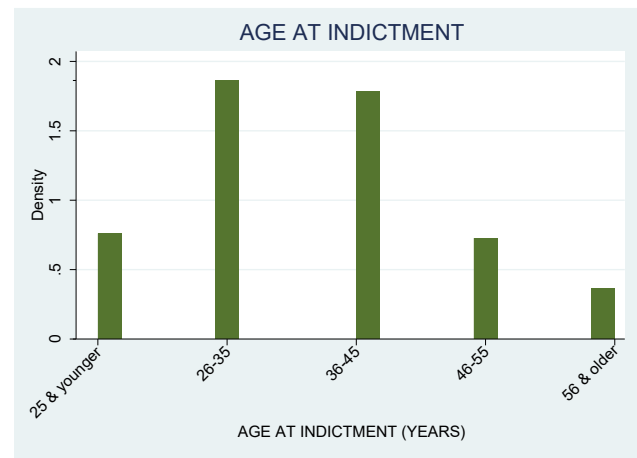
Sex	Frequency	Percent
Female	59	10.28
Male	513	89.37

SEX: a dummy variable for male or female. n=574, and there are only 2 missing values. I am not surprised that about 89% of the offenders in this data set are males.



GRP_TYPE- what type of group carried out the specific attack. Specifically, what is their general ideology. n=574, and there are 5 “missing” or unknown values. I am surprised that there is not more single-issue terrorism. This may be due to researchers not knowing how to classify certain individuals/groups.

AGE- age in years at the time of indictment. n=574, and there are 75 missing values. It is a categorical variable looking at 10 year ranges such as 26-35, 36-45 and so on.



Marital Status	Frequency	Percent
Married	252	44.08
Single	88	15.33
Divorced	43	7.49
Other	15	2.61

MARITAL: Marital status- single, married, divorced, other. n=574 and there are 175 unknown or missing values.

Section VI: Works Cited

DeLeeuw, Joseph Gregory, and William Alex Pridemore. "The Threat from Within: A Conjunctive Analysis of Domestic Terrorism Incidents in the United States, United Kingdom, and Ireland." *Perspectives on Terrorism* 12, no. 4 (2018): 26-54.

<https://www.jstor.org/stable/26482977>.

"Document: DHS Strategic Framework for Countering Terrorism and Targeted Violence." *The Washington Post*, WP Company, 30 Sept. 2019, www.washingtonpost.com/context/document-dhs-strategic-framework-for-countering-terrorism-and-targeted-violence/6ab1fa62-3f48-417b-8416-99ca255f5da7/.

LaFree, Gary, and Laura Dugan. "Research on Terrorism and Countering Terrorism." *Crime and Justice* 38, no. 1 (2009): 413-77. doi:10.1086/599201.

<https://www.jstor.org/stable/pdf/10.1086/599201.pdf?refreqid=excelsior%3A341c3e41fb6b0bc9a78ac9bb41350dc7>

LaFree, Gary et al., "Trajectories of Terrorism - Attack Patterns of Foreign Groups that Have Targeted the United States, 1970-2004," *Criminology and Public Policy* 8, no. 3 (August 2009): 445-474.

<https://heinonline.org/HOL/Page?handle=hein.journals/crpp8&id=451&collection=journals&index=#>

Ratcliff, Katie, Shields, Christopher A. "Examining Terrorist Pre-Incident Affirmation Behaviors." *ASC 2016 Annual Meeting*. New Orleans, LA

<https://www.ncjrs.gov/pdffiles1/nij/grants/249673.pdf>

Smith, Brent, et al. *Terrorism in Time and Space: The Inclusion of Spatio-Temporal Data from Federal Terrorism Cases into the ATS Database*, Terrorism Research Center at University of Arkansas, 2008.

"Terror Targets in the West: Where and Why." *Counter Extremism Project*, One 95, 2016, www.counterextremism.com/sites/default/themes/bricktheme/pdfs/terror-targets-122116.pdf.