

Geography and the Certainty of Terrorism Event Coding

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Abstract

While event data provides researchers with insight into contemporary security threats, many are built upon secondary sources that may insert bias into empirical studies. Specifically, we argue that one form of bias—description bias—can be conditional on an event’s characteristics or locale, thus influencing the certainty an observation is coded as an act of terrorism. We find that, using the Global Terrorism Database’s own variables, attacks on civilians, particular types of tactics, and attacks that occur closer to a populated place are more likely to be coded as terrorism. These findings speak to broader conceptual issues in terrorism research and reiterate the need for researchers to evaluate the validity of their data before making claims.

Keywords: terrorism, reporting bias, geography, description bias

The Challenges of Studying Terrorism

Gathering reliable political science data has always been challenging. More than a century ago, A. Lawrence Lowell (1910, 10) noted that “statistics, like veal pies, are good if you know the person that made them, and are sure of the ingredients.” In other words, our ability to draw inferences was then, and still is, deeply connected to the quality of our data. This is especially important as sources have proliferated both in number and complexity. Thinking about the origin of our data is vital, particularly when we use them to make claims, as small oversights may result in serious issues in the estimation and interpretation of statistical relationships.

While all topics of study within political science can suffer from data quality concerns, we focus on the issue of description bias—a specific type of reporting bias—in the creation of terrorism data (Earl et al. 2004; Weidmann 2016). The obstacles facing the collection of terrorism data are daunting and, as a result, researchers have relied upon secondary sources—media reports, books, journals, and other published documentation—for their data collection efforts (LaFree and Dugan 2007). These data

have proved quite common in the study of terrorism; Silke (2001) notes that almost 80 percent of published terrorism research has employed the use of secondary, as opposed to primary, resources. In fact, the large cross-national terrorism databases are all comprised of information provided by secondary sources, particularly newspaper articles.¹

Given that our inferences “are only as good as the data we use,” it is important to understand whether the collection processes that give rise to our datasets are sound (Hendrix and Salehyan 2015, 393).² Research has already established the selectivity of the press; sources are more likely to report violent, large-scale, and urban

¹International Terrorism: Attributes of Terrorist Events (ITERATE) (Mickolus et al. 2011), the RAND Database of Worldwide Terrorism Incidents (RDWTI) (RAND Corporation 2014), and the Global Terrorism Database (GTD) (National Consortium for the Study of Terrorism and Responses to Terrorism (START) 2017).

²See Brady and Collier (2010) as well as Davenport and Moore (2015) for a discussion of “best practices” regarding the creation of datasets.

events (Danzger 1975; Baum and Groeling 2010). Media reports are also likely to favor some regions of the world over others (Hafner-Burton and Ron 2013). And finally, the determination of newsworthiness is likely to differ based on the political conditions of the state in which the press organization is based (Baum and Zhukov 2015).

Unsurprisingly, the effects of description bias likely apply to the Global Terrorism Database (GTD), especially because the GTD is constructed using accounts from secondary sources. This form of bias does not relate to whether a story is covered, but how that event is described by the media. The thoroughness of a description is important because acts of political violence are often ambiguous (see Weinberg, Pedahzur, and Hirsch-Hoefler 2004; Sambanis 2008), and researchers often need additional detail to assign acts of violence to their appropriate theoretical category. Such details are important since they allow us to determine, for example, whether a kidnapping was a criminal or terrorist act.

In line with the growing literature on bias in social science data (see Davenport 2010; Baum and Zhukov 2015; Weidmann 2015, 2016), we contribute by looking at event- and location-level factors that impact the level of detail media sources provide to terrorist events within the GTD. This description may impact coders' confidence that an act of violence satisfies the GTD's definition of terrorism. Further, we believe that issues of description bias speak to larger concerns within the study of terrorism, namely that of conceptual "borders" and "stretching" (Weinberg et al. 2004).

To test the relationship between media detail and coder confidence, we utilize GTD's "doubt terrorism" variable to operationalize the level of certainty attributed to a potential act of terrorism.³ We find that certainty is dependent upon both event- and location-specific factors. For event-level attributes, we find that acts that target civilians and employ tactics such as bombings and facilities/infrastructure attacks are more likely to be coded as "certain," relative to events without these characteristics. Further, those attacks that occur within close proximity to a populated area are more likely to be coded as "certain." The media may deem events that do not share these characteristics as simply less interesting or too costly to cover and thus provide less complete information.⁴

³The specific GTD variable is *doubtterr*.

⁴It is also plausible that these type of events cause GTD coders to become more conservative about what is deemed to be a terrorist attack and what is labeled as "doubtful." It is difficult to know, however, whether this reticence occurs despite rich detail in press reports or,

Our article proceeds in five parts. We begin with a discussion of past research on reporting bias, an important concern given that many terrorism datasets are constructed using news reports. The second section describes our argument that event and location-specific attributes leads to data in which observations may be nonrandomly coded as doubtful acts of terrorism. In the third section, we discuss our data and test whether event- and location-level factors impact coder certainty. The fourth section evaluates our results and the fifth section concludes.

Reporting Bias and Social Science Data Collection

A reliance on secondary sources has been a necessary element in the scientific study of interstate violence. Political events are frequent and widespread, making direct observation by a researcher all but impossible. As a result, scholars construct data based upon the observations and interpretations of others. These data have become ubiquitous throughout political science, ranging from cornerstones of traditional international relations research such as the Correlates of War (COW) project to newer entries such as the GTD. These sources have been critical in advancing knowledge, helping us to better understand the causes and consequences of political violence.

While these data are becoming more popular, there are growing concerns about both its accuracy (see Weidmann 2015) and the process by which our "events become news" (Galtung and Ruge 1965, 65). Consequently, it is important to understand how press biases may become present in our data and to what extent they influence it. This is particularly consequential today for terrorism research, as studies seek to answer important questions such as the motivations of terrorist groups (Nemeth 2014; Tokdemir and Akcinaroglu 2016) and where terrorist attacks are more likely to occur (Findley and Young 2012; Nemeth, Mauslein, and Stapley 2014; Nemeth and Mauslein 2017).

The creation of news is not an objective retelling of events. According to Molotch and Lester (1974, 101), the news is a result of "practical, purposive, and creative activities on the part of news promoters, news assemblers, and news consumers." As a result, the news product can be affected in two ways (Snyder and Kelly 1977; Earle et al. 2004). First is the issue of event selection; the dynamic of "supply and demand" between the media and its audience influences whether or not events are reported (Weidmann 2016). Second is the issue of

on the other hand, it is driven by a lack of specificity—and description bias—in press reports.

description bias, the focus of our study. This refers to the “veracity with which selected events are reported in the press” (Earl et al. 2004, 72). In other words, while reporters will accurately convey the basic information of an event, it is the more interpretational aspects—the impressions and inferences drawn—that can be subject to unintended distortion (McCarthy, McPhail, and Smith 1996; Earl et al. 2004).⁵

Selection Bias

In his discussion of media practices, Gans (2004) calls attention to the goal of efficiency as the driving force behind story selection. This is often exhibited in the location of the event; studies have indicated that American news sources have shown a preference for stories occurring in Western Europe or the Middle East (Larson 1982; Weaver, Porter, and Evans 1984; Moeller 1999). Others, such as Hafner-Burton and Ron (2013), argue that preference for location may differ based upon the subject matter. They show that, for the period from 1981 to 2000, three press sources in the United States and United Kingdom reported more heavily on human rights abuses in Latin America than any other region. This attention, they argue, results from the region’s importance in American political debates, its geographic proximity, and past media scrutiny. Variations in coverage have also been noted within the United States, with media sources often criticized as showing bias toward urban areas and the East Coast (Danzger 1975; Snyder and Kelly 1977; Myers 2000; Myers and Caniglia 2004)

Beyond geographic factors, the preference for reporting on large-scale and dramatic events can also impact news selection (Snyder and Kelly 1977). Moeller (1999, 18) notes a 1995 Pew study that finds “40 percent of international news stories have conflict . . . and foreign events and disasters usually must be more dramatic and violent to compete successfully against national news.”

⁵We wish to draw a distinction between our focus of description bias and the more commonly discussed concepts of “validity” and “reliability.” Validity refers to “the extent that [an indicator] measures what it purports to measure” (Carmines and Zeller 1979, 12), while reliability refers to “the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials” (Carmines and Zeller 1979, 11). Description bias should logically occur prior to the above concepts; the ways that events are portrayed can introduce subjectivity for those who code observations into data, thus influencing how reliable and valid their resultant measures are (Cingranelli and Richards 2010, 420).

As a result, the news audience is exposed to a steady stream of international drama, influencing their perceptions of the world (Brewer et al. 2004; Wanta, Golan, and Lee 2004; however, see Salwen and Matera 1992).

Lastly, a story’s likelihood of being selected can vary based on what issues the media deem relevant at the time. Short-term events, like natural disasters, make headlines while longer-running crises receive less attention. Such stories are “fresher” and more appealing for journalists, while protracted events seem less interesting and less prone to resolution (Moeller 1999). Hocke (1999) and Myers and Caniglia (2004), for example, note that the frequency at which newsworthy events occur will impact their likelihood of being reported. When multiple events occur within a short period of time, the chances of any one of those events being reported will decline (Snyder and Kelly 1977; Oliver and Myers 1999; Oliver and Maney 2000).

Description Bias

The second form of bias relates to the ways in which media sources, once they select an event, interpret it (Snyder and Kelly 1977; Davenport 2010). We examine this type of bias, asserting that event-specific and geographic factors will impact secondary sources’ completeness of information. This, in turn, will affect GTD coders’ ability to establish whether an attack is truly terrorism.

Event-Specific Factors

First, we note that attack attributes may shape how it is interpreted. An act of terrorism, as defined in the GTD, requires a large amount of information: as opposed to other acts of violence, terrorist acts must be “intentional[,] . . . entail some level of violence or immediate threat of violence[,] . . . [and involve] subnational actors” (START 2017, 9-10). Further, the acts have to show a combination of the following: that they were “aimed at attaining a political, economic, religious, or social goal[,] . . . [have] evidence of an intention to coerce[,] . . . [and are] outside the context of legitimate warfare activities” (START 2017, 10). Such attributes are important for accurately coding an event as terrorism.

Past work has established that attacks on certain targets garner larger media coverage than other targets, and that attacks on civilians specifically are especially likely to be presented as terrorism (Delli Carpini and Williams 1987; Weimann and Brosius 1991). This occurs because these types of attacks violate the norm of discrimination, which mandates that actors distinguish between military targets—which are acceptable—and civilian targets—which are not (Conrad and Greene 2015).

Labeling actors that engage in this strategy as terrorists—a term with decidedly negative connotations—then seems appropriate. The connection with civilians filters into reporting; Schmid and de Graaf (1982) note that the BBC at one point allowed the use of the word “terrorist” to describe any nonstate actors who carried out attacks against civilians. The Associated Press would later adopt the same criteria, as would some major American newspapers (Gelfand 2002). This leads to our first hypothesis:

H1: Events in which civilians are the targets are more certain to be acts of terrorism.

A second event attribute that may drive reporting certainty is the tactic used. Because terrorists rely upon the media for exposure and publicity, they employ tactics that attract the highest coverage (Weimann and Winn 1994; Lee 2013). Delli Carpini and Williams (1987) note that tactics that pose a risk of harm or death to their targets, despite being less common, garner more media coverage than those that do not. This trend also holds for the United States; Chermak and Gruenewald (2006) show that events that involve casualties or destruction were more likely to gain press coverage than events that do not. Finally, Conrad and Greene (2015) note that violent attacks, such as Islamic State (ISIL) beheadings of hostages, lead to substantial increases in media coverage, relative to the less violent kidnappings that precede them.

It is important to note, however, that tactics not only differ in their newsworthiness but also in their likelihood of being described as “terrorism.” Schmid and de Graaf (1982, 62) note that tactics such as hijacking, indiscriminate bombing, and assassination were more likely to be labeled as terrorism compared to acts such as torture, kidnapping, and sabotage. The former group of tactics are unambiguous; they are easily understood to be violent and thus easily reportable (Galtung and Ruge 1965; Weimann and Winn 1994). Their attributes then serve to shape reporters’ perceptions of current and future events. Norris, Kern, and Just (2003, 4) note that “although the specific details surrounding any terrorist occurrence may be unique . . . the way that journalists observe and report each of these occurrences is shaped by how similar events have been covered in the past.” These dynamics might also cause journalists to “prioritize some facts, images, or developments over others, thereby unconsciously promoting one particular interpretation over others” (Norris et al. 2003, 11).

Given that events with more violent tactics are more likely to be labeled as terrorism, we believe that the presence of violence will increase the level of certainty attached to terrorist events in the GTD. As a result:

H2: Tactics of increasing violence are more certain to be acts of terrorism.

Finally, we believe that the number of people killed in an attack also contributes to definitional certainty of terrorism. Terrorism consists of a wide number of acts, ranging from threats that result in no physical harm to large events that claim thousands of lives. Nevertheless, reporting is consistently drawn to those incidents that involve the deaths of perpetrators or victims, thus distorting the true variability that exists across acts of terrorism, and increasing the public’s fear. These trends are well-established in the literature: events with higher numbers of fatalities have consistently attracted increased coverage (Weimann and Winn 1994; Nacos 2002; Kern, Just, and Norris 2003).

The media’s attention to casualty numbers also affects interpretation. Yarchi et al. (2013) show that the press is more likely to adopt the frames of the victimized country—such as identifying the act as terrorism, highlighting the savagery of the perpetrators, and noting the innocence of the victims—as the number of casualties increase. Similarly, these types of incidents are also likely to trigger a specific reporting routine that Wolfsfeld, Frosh, and Awabdy (2008) call the *victims mode*. Here, journalists are “giving vent to the shock, grief, and anger that accompanies such experiences” (403). These stories highlight the drama of the event, personalize the victims, and use the country’s political leadership as sources. Moreover, the language will be stirring, with the media describing the event and the perpetrators in the most vivid and vilifying terms. This impacts the certainty of coding decisions, leading to the third hypothesis:

H3: Attacks that claim more lives are more certain to be acts of terrorism.

Geographic Factors

In addition to event-specific attributes, geographic factors may affect the interpretation of terrorist violence. The most valuable information in determining certainty will come from those who experience the event (Fleeson 2003; Weidmann 2015). However, it is both difficult and costly to maintain a reporting presence in a wide range of locales, particularly when a location holds little relevance for the reading and viewing public (Moeller 1999; Gans 2004). As Gans (2004, 125) notes, even within the United States “large areas . . . especially rural sectors and low-income neighborhoods, remain uncovered.”

As a result, reporters may have to work at a distance from the act of violence. Weidmann (2015) notes that the further an act of violence takes place from a populated place, the fewer potential observers exist who can

provide useful information. Furthermore, any nonlocal sources that are used are likely to be of lower quality. As Davenport (2010, 70) notes, “[they] are less able to navigate the local terrain (physically but also politically and socially). Outsiders are less able to identify events, less able to understand who the combatants are, and less able to know where the best informants can be found.” These patterns may greatly influence the quality of information in news reports (see Azar et al. 1972; Danzger 1975). Thus,

H4: The more proximate an event is to a populated place, the more likely the event is certain to be an act of terrorism.

We also believe that it may be easier for journalists to gather and report more reliable information in attack locations where economic productivity is highest. This may occur because wealthier areas are likely to have well-developed transportation and communications infrastructures. This increases the likelihood that information about an attack will be publicized and picked up by reporters and news bureaus (Croicu and Kreutz 2017). Consider as an example the January 16, 2013, attack on the Tigantourine gas facility near the town of In Amenas, Algeria. Details of the event immediately captured headlines despite its significant geographic distance (more than twenty-two hours) from the city of Tamanrasset. We therefore add the following hypothesis:

H5: The greater the productive capacity of a local area, the more likely an event is certain to be an act of terrorism.

Data and Methods

We focus on the GTD for a number of reasons, the first being the origin of the data. The GTD is comprised of “publicly available, unclassified source materials” from a wide array of sources, including “electronic news archives, and to a lesser extent, existing data sets, secondary source materials such as books and journals, and legal documents” (START 2017, 3). Second, the GTD has an immense breadth and scope. The 2017 version of the database contains information on 170,350 acts of violence from 1970 to 2016 occurring in 205 different states and territories. In addition, the GTD’s definition of terrorism—“the threatened or actual use of illegal force and violence to attain a political, economic, religious, or social goal through fear, coercion, or intimidation”—is quite broad, allowing researchers to tailor their analyses to suit their own particular interests (START 2017, 9).

We also wish to highlight two additional attributes that influenced our decision to use this dataset. The first is

the increased presence of georeferenced variables within the GTD. Since its 2012 iteration, the GTD has included WGS84 latitude and longitude coordinates for many of the events in the dataset, allowing users to map terrorist incidents with varying levels of accuracy (START 2017, 21). In the most recent iteration of the GTD, the entire sample has been geocoded, with each attack being assigned a five-part score based on its accuracy. For our study, we analyze events with a specificity score of three or below; this coding rule captures approximately 93 percent of the total data in the GTD.⁶

The geocoding of the GTD allows us to spatially merge acts of violence with the PRIO-GRID spatial grid structure (Tollefsen, Strand, and Buhaug 2012). We overlay this latter data source, comprised of 64,818 cells measuring 0.5×0.5 decimal degrees for all global terrestrial locations, over the GTD. This allows us to connect spatial factors such as distance to capital, distance to border, economic development, and mountainous terrain to the locations of violence. The use of grid cells as a structure in which to base our data is an increasingly common practice in comparative and international politics research (see Pierskalla and Hollenbach 2013; Nemeth et al. 2014; Wischnath and Buhaug 2014).⁷

⁶This variable is called *geocoding specificity*. An attack coded as 1 indicates that an “event occurred in a city/village/town and the lat/long is for that location.” Attacks that are coded as 2 are for events that occur within a city, village, or town, but there is no exact latitude or longitude. Instead, the included geolocation is for the centroid of the “smallest subnational administrative region identified” (START 2017, 21–22). Events coded as 3 *did not* occur within a city, village, or town, so the coordinates for the event are the centroid of the smallest subnational administrative region. A geocoding specificity of 4 denotes that “no [second-order or smaller region could be identified, so coordinates are for the center of the [first-order administrative region” (START 2017, 22). Lastly, events coded as 5 are for regions in which “no first-order administrative region could be identified,” thus there is no included latitude/longitude (START 2017, 22).

⁷While Buhaug et al. (2010, 16) point out that “[it] may be contended that geographical cells are artificial and have no inherent political meaning compared to other alternative disaggregated units such as politically defined regions,” it should be noted that grid cells remain constant while politically or ethnically defined regions can vary substantially in size across time and space.

The second important attribute is the GTD's own measure of event certainty. This measure, called "Doubt Terrorism Proper?," is a dichotomous variable indicating "where there is a strong possibility, but not certainty, that an incident represents an act of terrorism" (START 2017, 15). The variable takes a value of 1 when there is doubt that an act of violence was one of terrorism. Doubtful acts occur when GTD analysts see the act of violence as "(1) insurgency/guerrilla action; (2) other crime type; (3) intra/intergroup conflict" or when the act involves "(4) [a] lack of intentionality; [or a] (5) state actor" (START 2017, 10). When these items are not present, the measure has a value of zero and indicates that there "is essentially no doubt as to whether the incident is an act of terrorism" (START 2017, 15).⁸ We reverse this indicator, so that 1 indicates certainty and use it as our dependent variable.

Independent Variables

Our first independent variable concerns the target of an act of violence. The GTD provides twenty-two different categories of targets, ranging from those most traditionally associated with terrorism—"private citizens and property"—to others such as the military, other terrorist organizations, and violent political parties. We follow Polo and Gleditsch (2016) to collapse these categories into a dichotomous variable that delineates between government-related targets, typically called "hard" targets, and civilian, or "soft" targets. Targets coded as 0 are hard targets; these are "targets associated with the government and underpinning state control, including police and core infrastructure" (Polo and Gleditsch 2016, 822). Targets coded as 1 are soft targets and are defined as "all organizations and individuals with no official role in the state apparatus" (Polo and Gleditsch 2016, 822).⁹

To test our second hypothesis on tactics, we utilize GTD's *attacktype1* variable. This divides terrorist tactics into nine main categories ranging from assassinations and hijackings (the most severe) to facility attacks and unarmed assaults (the least severe). We drop the ninth

category, "unknown." We create an ordinal variable, reversing the hierarchy so the least violent events have lower values than the more violent events.

Our third hypothesis concerns the number of people killed, drawn directly from the *nkill* variable in the GTD. This variable measures the "number of total confirmed fatalities for the incident [and] the number includes all victims *and* attackers who died as a direct result of the incident" (START 2017, 48). To account for the skewed distribution of this variable, with more than 53 percent of the events in our data causing no fatalities, we use the logged value of this variable.

For our first location-specific hypothesis, we consider the distance between an act of violence and the nearest populated place and use PRIO-GRID's minimum travel-time variable to generate the measure. PRIO-GRID defines the variable as the minimum "estimated cell-average travel time (in minutes) by land transportation from the pixel to the nearest major city with more than [fifty thousand] inhabitants" (Tollefsen et al. 2012, 6). Given that this measure is also not normally distributed, we use its logged value.¹⁰

Finally, to test the impact of local economic capacity, we use a measure of gross cellular product as derived from Nordhaus's (2006) *G-Econ* dataset and adapted for the PRIO-GRID. This measure, which varies over time, is only available at five year intervals beginning in 1990 and ending in 2005 (Tollefsen et al. 2012, 12). We interpolate values across the missing years, extrapolate to 2010, and log this variable.¹¹

Control Variables

We also include a number of controls. The first is the state's level of media freedom. This measure captures the extent to "which journalists are able to criticize political and economic elites at both the national and local levels" (Whitten-Woodring and Van Belle 2017, 180). This three-part measure scores a state's media environment as either free, imperfectly free, or not free. We believe that this is a more effective measure of press freedom compared to regime type, as it captures those instances in which nondemocracies have free or imperfectly free media environments, as well as when democracies do not have free media. Higher levels of press freedom should afford the press greater latitude to report on stories of

⁸This variable has 13,786 missing values, which are dropped from the analysis.

⁹See Appendix Table A1 for a list of the GTD target types and their categorization as either hard or soft targets. Three target categories listed in the GTD (abortion-related, terrorists/nonstate militias, and violent political parties) are not categorized by Polo and Gleditsch (2016). In Appendix Table A2, we label these as hard targets—in order to provide a more difficult test for our first hypothesis—and found similar results.

¹⁰In order to prevent 0 values from being dropped, we add 0.01 to these values prior to logging them.

¹¹We add 0.00001 to the zero values prior to logging them.

their own choosing.¹² Data for this variable comes from Whitten-Woodring and Van Belle (2014).

We also incorporate several variables from the PRIO-GRID data (Tollefsen et al. 2012). First, we include a measure of the percentage of mountains within each cell. We believe that including this variable helps to account for the obstacles posed by geography (other than distance) that may hinder accurate reporting of possible terror events. This measure is derived from the UNEP's *Mountain Watch Report* (2002), which measures the average proportion of mountainous terrain within each cell.¹³ Since this variable does not have a normal distri-

¹²Although we believe that the press will be better able to report on terrorist incidents in high media-freedom states than low freedom ones, we qualify our statement for two reasons. The first is that acts of terrorism may cause countries, even those with high media freedom, to adopt restrictions on media content. Two examples of this come from the United Kingdom: the Contempt of Court Act 1981 and the Terrorism Act 2000. In both, journalists face punishments for publishing information that might "prejudice an investigation of an ongoing or proposed terrorist investigation" (Cram 2006, 342). Further, the 2000 Act also creates the offense of collecting "information of a kind likely to be useful to a person committing or preparing an act of terrorism" (Cram 2006, 342). Aside from punishing journalists that violate these laws, the mere threat of these laws may have a chilling effect on the decision to report or the amount of detail included in a story. A second consideration for these countries is that of "indexing" (Bennett 1991). Indexing implies that the press will limit their coverage to those issues which official or elite circles of policymakers deem salient. Further, the press will present issues in a manner consistent with the opinions of those policymakers—oftentimes using them as sources. The media, in this view, are simply "transcribers of official utterances" (Mermin 2004, 69). The press's widespread framing of the events in the Abu Ghraib prison as "abuse" rather than torture (Bennett, Lawrence, and Livingston 2006), as well as its reliance on the government's rhetoric of "the war on terror" to describe a wide range of events after 9/11 (Lipschultz 2007), may serve as two examples of indexing.

¹³Mountainous terrain is defined in the report using both altitude and slope; this results in six categories of locations exceeding 300 meters, as well as a seventh category including basins and plateaus located in mountainous regions (UNEP 2002).

bution, with most cells reporting a zero value, we use its logged value.¹⁴

A second cell-level control is population density (Tollefsen 2012, 9). To obtain this, we divide the cellular population, adapted from the Gridded Population of the World Dataset (CIESIN 2005), by each cell's land area. This provides us with the average number of people per square kilometer within each cell. Since the CIESIN (2005) data are only available at five-year intervals, we interpolated the measure across the missing years. We also log this variable.¹⁵

An event's proximity to a border may also impact its likelihood of being reported as a terrorist act. Journalists may report on events happening in one country from a second, especially if the first has strict rules regarding movement of the press. Violent events are therefore likely to be filtered through the eyes of refugees or others who may move across the border. As a result, it is likely that information from near-border locations may be more complete than those from further away. We assess this by including a border distance measure from PRIO-GRID (Tollefsen et al. 2012). This is measured as the straight-line distance in kilometers from the cell centroid to the border of the nearest contiguous state. This variable is logged.

We also control for whether the cell is experiencing a civil war, given that it may be difficult for observers to differentiate insurgency or guerrilla actions from instances of terrorism in these cases.¹⁶ Further, it may be difficult for reliable information to flow from areas experiencing civil violence, as security and infrastructure concerns may impact the quality of reporting. To account for civil war, we include the *civconf* variable from PRIO-GRID data (Tollefsen et al. 2012). This dichotomous variable indicates whether a cell has suffered an "internationalized intrastate or intrastate conflict" (Tollefsen 2012, 7).

Further, we include a dichotomous variable indicating events that occurred after September 11, 2001. This is driven by Altheide's (2009) assertion that terrorism has become an important framing device for many threatening and nonthreatening events. Lewis (2005) finds evidence of this, noting that 2002 and 2003 each contained more terrorism-related stories than any year prior to 2001.

Lastly, we include a count of all of the terrorist events that take place in a state during a given year. This

¹⁴After adding 0.0001 to the zero values.

¹⁵We add 0.001 to the zero values prior to logging them.

¹⁶The GTD codebook cites "insurgency/guerrilla action" as a one of five designations that lead to an event being coded as doubtful (GTD 2017, 10).

measure helps control for the spatial and temporal clustering of terror events (Nemeth et al. 2014). Furthermore, it could be the case that reporting may concentrate on certain areas of the world during particular times, which potentially confounds results as the observability of events may vary significantly due to the proximity of concentrated media attention (Earl et al. 2004, 74).

Because our dependent variable is dichotomous, we use a logistic regression. To help account for the spatial correlation in the data, we report standard errors clustered on the country.

Results and Analysis

Table 1 presents our empirical results. We find support for Hypothesis 1: the delineation of a target as either a hard or soft—essentially a distinction between

government and civilian targets—does have an effect on coding certainty. In particular, we find that soft targets are more likely to be coded as terrorism. Our marginal effects result reinforces this: hard targets have a 87 percent likelihood of being coded as certain while soft targets have a likelihood of just more than 92 percent.¹⁷

We find no support for Hypothesis 2. Instead of finding a positive relationship between attack type and certainty, we see the reverse. However, if we disaggregate attack type into seven distinct dichotomous variables—indicating the different attack types with “facility and infrastructure attacks” as the excluded category—the effect is more nuanced than the statistical results imply.¹⁸ The results show that some attack types have higher likelihoods of certainty than others, as confirmed in a contrast plot of the marginal effects (see Figure 1). Relative to our baseline category, we find that unarmed assaults and kidnappings are more likely to be coded as certain. On the other hand, hijackings are less likely to be coded as certain. The other categories are not statistically different from the baseline.

Our results for Hypothesis 3 also run counter to our expectations: more deadly attacks reduce certainty rather than increase it. Our marginal effects suggest that as we move from the fifth percentile of terrorist fatalities—attacks in which no one is killed—to the ninety-fifth percentile—attacks in which ten people are killed—event certainty decreases from 91.8 percent to 85 percent. This may indicate the profound differences in scope seen across various forms of violence. In fact, Merari (1993) suggests that terrorism only victimizes a small number of individuals per attack, while those impacted by guerrilla actions are much higher. As a result, in limited information environments, the number killed may suggest that an event is not terrorism but instead some other form of violence.

We also see in Figure 2 that the results are conditional on a state’s level of media freedom: the negative effect of casualties on event certainty varies across different levels of media freedom. In particular, we note that the greatest decrease is shown for countries with a partially free media, followed by those with a not-free media, and finally those with a free media. This finding emphasizes that the reporting and interpretation of events will

Table 1. Logit estimation of event certainty

Target type	0.576*** (0.037)
Attack type	-0.060*** (0.014)
Number killed	-0.100*** (0.007)
Media score	0.152*** (0.055)
Travel times	-0.019*** (0.006)
GCP per capita	0.007 (0.021)
% mountainous	0.007 (0.006)
Population density	0.063*** (0.022)
Border distance	0.114*** (0.017)
Civil war	-0.213*** (0.054)
Number of attacks	0.001*** (0.000)
Post 9/11	0.318*** (0.047)
Constant	0.579** (0.230)
N (countries)	28,865(143)
Log likelihood	-11084.79
χ ²	814.41***

Notes: (1) Standard errors clustered on country in parentheses. (2) Statistical significance: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$. (3) Number killed, travel time, GCP per capita, percent mountainous, population density, and border distance are logged.

¹⁷Marginal effects results for continuous and dichotomous variables are available in the supplementary materials (Table A3); marginal effects for media freedom are available in Table A4.

¹⁸These results are available in the supplementary materials (Table A5).

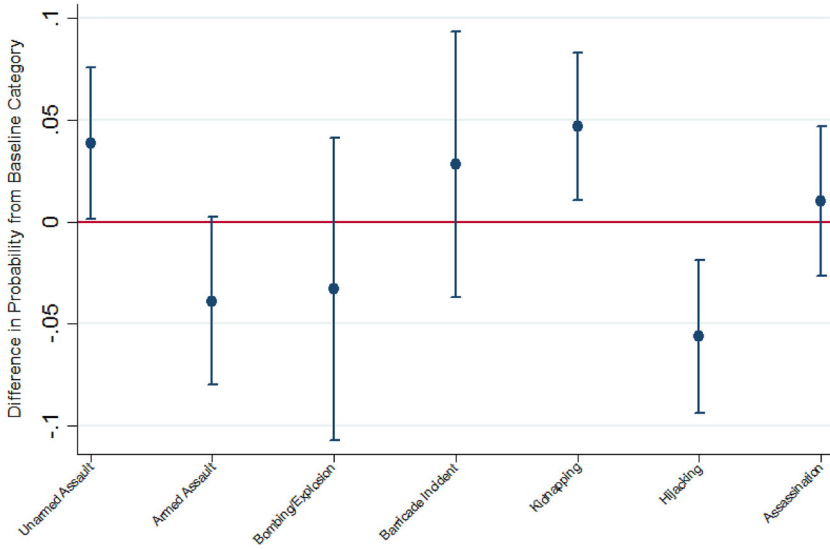


Figure 1. Marginal effects contrast plot of terrorist attack types.

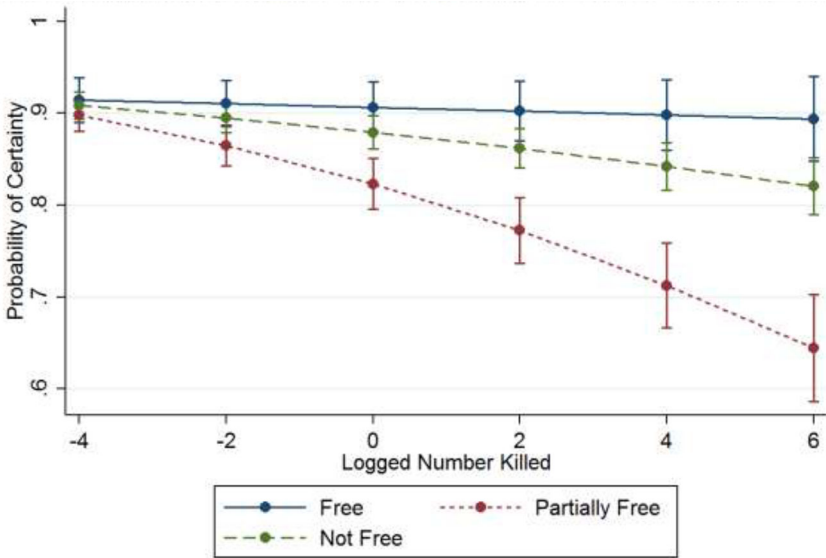


Figure 2. Marginal effects of number killed on certainty, conditioned on media freedom.

differ based on the state’s media environment, in line with previous research on reporting bias (Drakos and Gofas 2005; Baum and Zhukov 2015).

The significant decrease in coding certainty across partially free and not-free media environments reflects not only the effectiveness of government efforts to restrict the media, but also states’ concern about publicizing acts of violence. In particular, these governments are concerned that reporting on violence may undermine their

authority (Kuran 1989; Lohmann 1994). That this uncertainty persists despite the wide range of sources used by GTD—including domestic and international news sources—highlights the extent to which governments restrict reporting of particularly deadly events and the success they have in doing so.

Our results in Table 1 provide support for our fourth hypothesis and show that travel time between an attack location and major populated areas has a negative

and significant effect on event certainty. As travel time increases, it becomes increasingly likely that a violent event is not coded as an act of terrorism. Substantively, we find that as travel time increases from the fifth percentile (0 km) to the ninety-fifth (97 km), the likelihood that a violent act is coded as terrorism decreases by 2.03 percent. This finding provides cross-national support to Weidmann's (2015) finding that increased travel time between attack locations and population centers leads to drops in news reporting accuracy for violent events in Afghanistan. In line with these findings, we believe that distance is likely to reduce the quality of the information collected, rendering reports of individual data observations less descriptive and less likely to be defined as terrorism.

Finally, we find no support for our fifth hypothesis. Instead, we see that attacks in areas of higher economic capacity are not more likely to be coded as certain. To ensure that no statistical relationship is present, we also run our model using a nonlinear specification of area wealth; again, our results for wealth are not statistically significant.¹⁹

The influence of our control variables on terrorist event certainty vary in important ways. At the local level, the effect of mountainous terrain is positive, but not statistically significant. We find support for the effect of population density, suggesting that attacks occurring in more densely populated areas are more likely to have increased numbers of witnesses, thereby further increasing the level of certainty attached to an act of terrorism. Contrary to our expectations, we find that border distance is positive and significant, indicating that events taking place further into a state's territory are more likely to be coded as terrorism. Assuming that information is collected from within the state, border areas may be less accessible for reporters, thus affecting certainty. Finally, we note that cells experiencing civil war are less likely to be coded as certain.²⁰

Lastly, the state-level variables accounting for the post-9/11 era and number of previous attacks are also positive and significant. The results suggest that the events of 9/11 have had an enduring and international impact and now serve as a frame to define other acts of violence (Lewis 2005; Altheide 2009). Our results for previous attacks are also as expected; states with greater

levels of terrorism in a given year are more likely to experience incidents coded as certain.

Conclusion

While event datasets are a vital component of international relations research, they introduce a number of concerns regarding the reliability and certainty of the events (see Carmines and Zeller 1979). The benefits of using these data are numerous; political science has been able to pursue new ideas and make empirical claims on a wide variety of new issue areas. With these positive developments, however, comes the responsibility to understand the ways in which media-based data can be biased and how it may affect the conclusions that we draw (see Woolley 2000).

In the case of terrorism, the impact of bias is particularly important. As a concept, terrorism already suffers from several problems. First, it is difficult to assign terrorism a conceptual boundary; some acts of terrorism may be indistinguishable from other acts of political violence. Second, what constitutes an act of terror may differ based on context; the actions of some perpetrators and the suffering of some victims may be more likely to be labeled as terrorism than others (Weinberg et al. 2004). In addition, terrorism is also prone to both "stretching" and "traveling" problems; the desire to label particularly disagreeable acts and those that are physically or psychologically distant as terrorism may be overwhelming. As such, terrorism shares the hallmarks of an "essentially contested concept," and the biases of observers—often unintentional—will filter down into the data that we use to study terrorism (Connolly 1993, 10).

With this in mind, we believe that this study provides important contributions to both the study of terrorism and the factors that influence description bias. First, while previous research shows that local-level factors influence the likelihood of terrorism (Berrebi and Lakdawalla 2007; Nemeth et al. 2014; Nemeth and Mauslein 2017), we show that they also have an impact on the interpretation of a violent event as terrorism. Second, we demonstrate that the event attributes themselves also play a role in event certainty. As such, this both confirms and extends previous research that focuses on country-specific event data (see Weidmann 2015; Behlendorf, Belur, and Kumar 2016), as well research that evaluates the properties of other event datasets (see Hammond and Weidmann 2014). Our results also reinforce broader findings about the newsworthiness of terrorism; events that claim civilian lives and those that employ deadlier tactics are all more likely to be considered as terrorism (Schmid and de Graaf 1982; Weimann and Winn 1994).

¹⁹These results are included in supplementary materials (Table A6).

²⁰Table A7 in the supplementary materials includes a model without a civil war control.

Notably, event certainty is not affected by the number of lives lost nor economic capacity. These findings highlight the issues related to conceptual boundaries and stretching that characterize the study of terrorism.

Gaining a better understanding of the factors that affect coding certainty may prove useful in the further refinement of the GTD. One suggestion may be the implementation of an “error profile” (Chermak et al. 2012). Initially employed by the US Census Bureau, these profiles help to pinpoint “possible sources within the data collection methodology that may bias the results through nonsampling errors” (Chermak et al. 2012, 215). In this case, a potential error profile might address the issue of description bias—namely how accounts of terrorism may be affected by the nature of the target, the tactic used, and the event’s distance from a populated place. The GTD can then use this information to increase the transparency of the coding process and make users “aware of the known errors in the data set so they might change their analysis or their inferences from the analysis accordingly” (Chermak et al. 2012, 215). Potential solutions may then come from the broader research community, further improving data collection efforts.

Our efforts should not be construed as a means to detract from the GTD’s existing contributions. The collection, compilation, and digitization of the original dataset represents an enormous task. The scope of the current database and the annual collection and dissemination of information are also welcome by the terrorist research community, particularly given the decentralized nature of past data collection efforts. Furthermore, the entire effort surrounding the GTD has motivated the research community to consider issues of data validation and comprehensiveness in a way they had not done before (also see LaFree 2010). Our project is an outgrowth of this endeavor and a means by which to further improve data that is vital in the systematic study of both domestic and international terrorism.

Supplementary Information

Supplementary information is available at the *Journal of Global Security Studies* data archive.

Supplementary.docx

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