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Terrorist Group Cooperation and Longevity[1]

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Why do some terrorist groups survive considerably longer than others? The literature is just beginning to address this important question in a systematic manner. Additionally, and as with most studies of terrorism, longevity studies have ignored the possibility of interactions between terrorist groups. This article attempts to address these two gaps in the literature: the incomplete understanding of terrorist group survival and the tendency to assume that terrorist groups act independently. In spite of risks associated with cooperation, I argue that it should help involved terrorist groups mitigate mobilization concerns. More importantly, the impact of cooperation is conditioned by attributes of the country in which a terrorist group operates. Using new global data on terrorist groups between 1987 and 2005, I show that cooperation has the strongest effect on longevity in states where groups should have a harder time operating—more capable states and less democratic states. Interestingly, a group's number of relationships is more important than to whom the group is connected.

Some terrorist groups last a year or less, while others wreak havoc for decades. Variation in the longevity of these groups is an important topic, but scholars are just beginning to approach the subject in an in-depth manner. Furthermore, all studies of terrorist group longevity have overlooked interorganizational relationships. As with most studies of terrorism, research on longevity has assumed groups are independent—although there are reasons to believe intergroup ties have meaningful consequences. This article attempts to address these two gaps in the literature: the incomplete understanding of terrorist group survival and the general tendency to assume that terrorist groups act independently. In spite of potential risks associated with cooperation, I argue that it can help involved groups mitigate mobilization concerns. Additionally, these relationships contribute to group duration more in states where terrorist groups should otherwise have a harder time surviving—in more capable and in less democratic states. Analyses of new global data support the argument.

Terrorist group longevity is important to understand because as long as terrorist groups exist, they pose a risk to the states in which they operate. Governments are concerned about terrorism generally, but often, conduct counterterrorism with the goal of eliminating specific groups. This research provides some expectations about the likely survival of various groups, depending on attributes such as intergroup ties.

Terrorism research has yet to adequately address the important question of terrorist group survival. Some early research laid valuable theoretical groundwork, but lacked substantial empirical analyses (for example, Crenshaw 1991). More recently, a group of studies creates typologies of the ways that terrorist groups can "end" (arrests, turning to nonviolence, etc.) and attempts to explain each type of ending (Cronin 2006, 2009; Jones and Libicki 2008). Carter (2012) looks at how state sponsorship affects different ending types. However, these studies lack a general explanation of group survival, regardless of how a group might end.[2] This is important because it is likely that some of the same underlying factors explain multiple ending types. When a terrorist group has difficulty mobilizing resources, it is more susceptible to ending—whether through internal dissolution, counterterrorism pressure, or otherwise.

Several studies make a first cut at the more general question of terrorist group survival, but only examine a subsample of groups, such as transnational groups (Vittori 2009; Blomberg, Engel and Sawyer 2010). Other articles analyze more comprehensive global samples of terrorist groups, among other important innovations (Young and Dugan 2010; Blomberg, Gaibulloev and Sandler 2011). Of all of the studies mentioned, only two use terrorist group data with any variation over time (Blomberg et al. 2011; Carter 2012). The extant literature has a more substantial shortcoming: None of the studies of terrorist group longevity consider that terrorist groups might affect each other. We do not yet know what role interorganizational relationships play, if any.

Regardless of the outcome being studied, research on terrorism often ignores the possibility that terrorist groups can affect each other in nontrivial ways. Scholars increasingly use the social networks framework to understand terrorism (Perliger and Pedahzur 2011), but most studies examine ties between individual terrorists, not groups.[3] This is in spite of the fact that terrorist groups frequently interact, and the few studies to systematically examine these interactions have found important consequences (for example, Bloom 2005; Horowitz 2010). Civil

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[2] Both research questions are worth studying. This is analogous to research on other phenomena (for example, military alliances or civil wars), which studies ending types as well as longevity generally.

[3] Examples and exceptions are discussed below.

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war scholars are beginning to study relationships among subnational participants (for example, Bapat and Bond 2012; Pearlman and Cunningham 2012), and research suggests meaningful effects on war outcomes (Akcinaroglu 2012). It is unclear, however, whether terrorist groups are affected in the same ways as civil war participants.

This paper addresses these gaps in the literature by arguing that cooperative relationships, through mitigating mobilization challenges, help terrorist groups survive. Alliances enable groups to gather resources they need to endure and help them more effectively attack—which contributes to recruitment and other ends. The argument also suggests that cooperation should have the greatest impact on longevity in countries where groups otherwise have a more difficult time operating, in more capable states and less democratic states. The paper also introduces a newly extended data set of relationships between terrorist groups.

The next section presents the argument about how cooperative relationships contribute to terrorist group survival. It also considers how state attributes condition the impact of these ties. The third section describes the data on global terrorist group ties, and the quantitative empirical tests. The fourth section concludes.

Terrorist Organizations, Cooperation, and Group Longevity

Terrorism is the use or threat of violence by nonstate actors to obtain a political or social goal through intimidation of a wider audience than their immediate victims (Enders and Sandler 2012). Terrorist groups are subnational political organizations that use terrorism.[4] As organizations, they face the challenge of overcoming the collective action problem (Olson 1965). Terrorist groups, like other subnational violent political groups, face what Lichbach (1995, 16) refers to as "the rebel's dilemma" or "the improbability of extensive collective dissent." Dissident groups want sympathetic individuals to join them in the struggle, but costs to the individuals—prison or death, for example—can be high. To survive, terrorist groups need to have attributes that give them advantages in mobilization.

Mobilization refers to the process of a group maintaining its resources (members, money, etc.) and getting new resources (for example, Tilly 1978, 54). Mobilization is vital for organizations, and terrorist organizations are no exception. These groups must seek out ways to stay strong, stay relevant, and therefore survive. One way terrorist groups can attempt to achieve these goals is through forming cooperative relationships with other terrorist groups. Relationships between groups have not yet been examined in the context of group longevity, but they are likely to play an important role.

In examining intergroup relations, this study draws on an important assumption from the social networks literature (for example, Wasserman and Faust 1994). Studies in this field emphasize that exploring relationships is critical because otherwise we would be falsely assuming the independence of actors. Social network theory provides a helpful framework for considering relationships and provides tools to examine data and empirically evaluate hypotheses. A number of terrorism studies have employed this framework. However, most of this research charts connections between individual terrorists (Sageman 2004; Pedahzur and Perliger 2006; Enders and Su 2007; Enders and Jindapon 2010; Helfstein and Wright 2011). A few studies have explored relationships between terrorist groups using social network concepts, showing that connections help groups become more lethal and learn new tactics (Asal and Rethemeyer 2008; Horowitz 2010; Asal, Ackerman and Rethemeyer 2012; Horowitz and Potter 2013). Other important research has studied terrorist groups' relationships without explicitly drawing on network theory (Bloom 2005; Karmon 2005; Siqueira and Sandler 2010).

Cooperative Ties and Their Consequences

Terrorists groups often share resources and collaborate on attacks. Karmon (2005) analyzes coordination between European leftist groups and also between European and Palestinian groups, primarily during the Cold War. More recently, Islamist groups such as Lashkar-e-Taiba and Hizbul Majahideen have worked together for mutual gain. Cooperation should generally enhance terrorist groups' durability, as it allows them to pool resources and resist both internal dissolution and external threats.

This argument is not necessarily intuitive, because cooperation could make terrorist groups more visible to the state, which in turn might make the state more likely to focus its efforts on eliminating these groups. Furthermore, cooperation can turn into dependence or competition, harming involved groups (Mendelsohn 2011, 42–44).[5] These reasons might be why some terrorist groups, such as Peru's Sendero Luminoso, have shunned collaboration with other terrorist organizations (Halloran 1987).

In spite of the possible drawbacks of cooperation, I argue that these relationships offer substantial advantages, generally outweighing their costs. Cooperation enhances group durability by facilitating resource aggregation, which is essential for survival. In addition to this direct mechanism, intergroup cooperation enables terrorist groups to attack more frequently and effectively. This, too, helps with mobilization of resources, reducing the likelihood of a group giving up or being defeated by the state. Resource aggregation and improved attacks should ameliorate mobilization concerns, which are especially important for the endurance of dissident groups such as terrorists.

Cooperation between terrorist groups helps them share resources. This is consistent with research on other types of organizations. Wiewel and Hunter (1985) posit that "resource exchange" is one of the most important ways that groups benefit from interaction. Lichbach (1995, 255–256) argues that "coalitions" between dissident groups can help with resource sharing. Cooperative relationships should be similarly important for terrorist groups. When sharing resources, groups do not have as much of a need to try to mobilize new members or gather other assets on their own. Cooperation can help groups meet their needs relating to personnel, training, weapons, and information, among other essentials.[6]

[4] This is a simplification, but is consistent with other studies offering definitions (Weinberg 1991; Jones and Libicki 2008; Young and Dugan 2010; Carter 2012). For more discussion, see Phillips (2013).

[5] Analysis of other types of subnational violent groups suggests additional potential problems with cooperation. Williams (2002, 89–90) examines criminal organizations, and finds that alliances can be beneficial, but also cites examples of cooperation leading to conflict and competition.

[6] This sharing of assets appears generally to be mutually beneficial and not simply one powerful group giving resources to a weaker group.

For example, Lashkar-e-Taiba reduced its personnel needs through cooperation. When it wanted to attack more in India's primary cities (as opposed to Kashmir, where it had been working), it could have recruited new members and built up a new logistics infrastructure. This would have been costly. Instead, it teamed up with groups in the areas it wanted to attack (Tankel 2009). Latin American terrorists, like groups elsewhere, have conducted joint training and collaborated on kidnaping to raise funds (for example, Agence France Presse 1996). Loyalist groups in Northern Ireland coordinated to order arms from abroad—a transaction that likely would have been less efficient if each group tried to interact with weapons dealers on its own (The Guardian 1988). Interorganizational ties are also important to helping groups learn new tactics (Horowitz 2010). These examples show how collaboration helps groups obtain resources and skills, which are crucial to groups' continued strength and relevance.

Cooperation can also help groups attack more effectively, which in turn helps them gather resources and survive. West Germany's Red Army Faction teamed up with other groups in the mid-1980s and was able to carry out a new wave of especially injurious attacks (Merkl 1995). Colombia's FARC started cooperating with the IRA, and FARC attacks "increased in their proficiency after the arrival of IRA members" (Seper 2002). Terrorist organizations with more allies tend to be more lethal (Asal and Rethemeyer 2008).

Attacks are a different outcome than group longevity, but increased violence can serve as propaganda to help recruit new members or show the group's relevance (for example, Hoffman 2006, 247–249). Hoffman argues that a terrorist group's ability to attract attention is often based on the success of their attacks. The "success" of attacks can be measured various ways, but joint efforts can help make attacks possible as well as more lethal. Increased visibility through attacks can then draw recruits and donations (for example, Bloom 2005). An invigorated attack campaign can also pressure the government to offer concessions, which can provide essential support to terrorist groups' continued efforts. Overall, cooperative ties contribute to resource aggregation, the facilitation of attacks, and the related mitigation of mobilization concerns, which in turn should help terrorist organizations survive.

Hypothesis 1: *A terrorist group is less likely to end with each additional ally.*

While cooperative relationships in general should help terrorist groups, the idea of a social network suggests that actors are embedded in a web of relationships beyond their own direct ties. The concept of *eigenvector centrality* refers to how well connected are the actors to which an actor has ties (Bonacich 1987). Some scholars refer to this as the "depth" or "quality" of relationships, as opposed to quantity (for example, Horowitz and Potter 2013). Horowitz and Potter find that terrorist groups with connections to well-connected groups are more lethal, and they show this to be more important than a group's count of cooperative ties. Ties to highly connected actors could also play a role in helping terrorist groups survive.

A terrorist group with more connections to highly connected terrorist groups should be less likely to fail because it is connected to important actors in the network. This could be more valuable than relationships generally because ties to important (well-connected) groups indicate the potential for more assistance with resources. Well-connected groups are likely to have more capabilities, a broad range of ties to draw on, to make relationship activity more consequential.

For example, al-Qaeda, with its approximately 30 ties, should be uniquely able to provide resources to its relationship partners. When it moved into Pakistan in the early 2000s, it brought a wealth of experience that helped Pakistani groups improve their attacks on Kashmir (Abou Zahab and Roy 2004, 65). Similarly, an alliance with the FARC should provide more benefits than a relationship with a less-connected organization. The FARC can draw on its many ties to assist less-powerful allies. Overall, connections to well-connected groups should help terrorist groups survive.

Hypothesis 2: *A terrorist group is less likely to end if it has more relationships with groups that are themselves connected to many groups (higher eigenvector centrality).*

The Conditioning Effects of State Attributes

The state in which a group operates can play an important role in conditioning the impact of intergroup relationships. The next set of hypotheses focuses on these conditional effects. The state attributes analyzed are *capacity* and *regime type*, as these are among the most-discussed state factors in relation to terrorism and terrorist groups.

State capacity matters because counterterrorism can terminate terrorist groups—especially when the counterterrorism is carried out by a relatively capable state.[7] Jones and Libicki (2008, 19) find that 40% of terrorist groups end as a result of police action.[8] Hendrix and Young (2012, 8) argue that when states are especially able to gather and manage information, it "should diminish the use of terror tactics by hampering the ability of terrorist groups to mobilize and conduct attacks." In less capable states, on the other hand, terrorist groups are more likely to survive (Young and Dugan 2010; Carter 2012).[9] For example, the weakness of the Colombian state has been cited as one of the chief reasons for robustness of terrorist organizations there (Waldmann 2007). However, countries vary substantially in their counterterrorism capacity.

Some countries have more effective law enforcement, judicial, and military approaches to preventing and reacting to terrorism. The United Kingdom, for example, has a broad array of counterterrorism capabilities. Sophisticated technology and training give UK agencies advantages in thwarting plots and bringing suspects to justice. Many countries do not have these resources. States such

[7] Hendrix and Young (2012) argue that there are two dimensions of capacity—military/material capacity and bureaucratic/administrative capacity. This section generally refers to the latter, because military force is less common and less effective against terrorists. This is discussed below and in the empirical section.

[8] Another 43% of groups ended in a less direct way, which Jones and Libicki call "politicization." This means the group turned to nonviolent politics, which is likely a result of government pressure and other factors, such as group attributes.

[9] In my data, descriptive statistics suggest that under certain conditions terrorist groups in highly capable states have higher failure rates than those in less capable states. See online Appendix S1. There is not always an unconditional linear relationship between state capacity and group failure, based on descriptive statistics, but this could be due to issues with the capabilities measure or confounding factors.

as Greece, the Philippines, and India have a relative lack of internal security capabilities and are therefore likely to be less effective at counterterrorism. Note that while state capacity is often discussed in terms of ability to confront armed dissidents (for example, Sánchez-Cuenca and de la Calle 2009), a possible additional mechanism is that citizens in capable states might have fewer grievances—suggesting mobilization challenges for terrorist groups.

Aside from the potential direct effect of state capacity on terrorist groups, capacity should *condition* the impact of terrorist group relationships on group survival. In all kinds of states, cooperative ties should contribute to terrorist group endurance. However, terrorist groups should have a harder time operating and surviving in capable states, so the benefits provided by relationships should be especially meaningful in these countries. Above it was argued that cooperative ties should help terrorist groups through resource aggregation, improved attacks, and the related mitigation of mobilization concerns. Groups should especially benefit from these advantages when facing capable states. This suggests the following conditional hypothesis:

Hypothesis 3: *The survival-enhancing impact of cooperative relationships on terrorist group survival will increase in more capable states.*

In addition to capabilities, states differ in important ways relating to the freedoms afforded to their citizens. Just as capable states make it harder for terrorist groups operate, autocratic regimes pose unique challenges for terrorist groups' continued efforts.[10] Regime type is likely to have a direct effect on terrorist group survival, but it should also condition the impact of terrorist group relationships in that state.

Regime type remains one of the most-discussed state attributes in terrorism studies (for example, Li 2005; Wade and Reiter 2007; Brooks 2009). Some studies suggest autocracies experience less terrorism because they make it harder for dissidents to organize and attack (Eubank and Weinberg 1994; Li 2005; Piazza 2007). When a terrorist group exists in an autocracy, the state can simply kill suspected members—without search warrants, trials, or concern about minimizing collateral damage. Argentina saw a considerable decline in terrorism during the late 1970s, largely because its military dictatorship killed or captured so many leftists and sympathizers, among others. A lack of constraints on the government is also a substantial part of the reason Saudi Arabia has had relatively little terrorism for a country of its size or region.

An autocratic regime type, then, is comparable to higher state capabilities. Burma is below average in terms of state capacity, according to common measures. However, due to its highly authoritarian regime type, it has a number of tools at its disposal for counterterrorism operations that more democratic regimes lack. Autocracy indicates fewer restrictions on the government, and therefore, a higher amount of capacity—or at least an additional set of capabilities—that the state can use in counterterrorism. Indeed, studies of democratic counterterrorism exist because democracies face unique challenges fighting terror (for example, Wilkinson 1986; Art and Richardson 2007). Terrorist groups in autocracies should generally have a more arduous existence than groups in more democratic countries.[11]

Terrorist organizations in more autocratic regimes, given the *ex ante* difficulties regarding survival, should be especially likely to benefit from ties to other terrorist groups. Cooperative ties should help terrorist groups in any type of environment. However, in conditions where the groups are especially challenged (more autocratic regimes), ties should be particularly advantageous to their mobilization needs.[12] Groups like the Karen National Union in Burma should profit more from an ally than groups in freer countries, such as India next door. The benefits provided by alliances—resource sharing, facilitating more and greater attacks—should be especially helpful toward terrorist group survival in the challenging conditions engendered by autocratic rule. In environments more conducive to terrorism (more democratic regimes), ties should not have the same degree of importance. This suggests the following conditional hypothesis:

Hypothesis 4: *The survival-enhancing impact of cooperative relationships on terrorist group survival will increase in more autocratic regimes.*

Research Design and Findings

The hypotheses are tested using a global data set of terrorist groups in existence at any point between 1987 and 2005. The sample includes 600 terrorist groups. The unit of analysis is group-year, and the number of observations is 3,922.[13] The data are an extension, with some changes, of Asal and Rethemeyer (2008) data from their study of terrorist organization lethality. Their data contain information on terrorist groups that existed between 1998 and 2005.[14]

Variables in the 1998–2005 Asal and Rethemeyer data do not vary over time. To make the data more amenable to duration analysis, I went back about 10 years and gathered data on terrorist groups between 1987–1989. This makes a late-1980s cross-section (wave) to compare with Asal and Rethemeyer's late-1990s and early 2000s wave. Examining some data in time periods is reasonable

[10] An alternate possibility is that autocracies' counterterrorism methods create a public backlash, providing increased popular support for the terrorism and helping groups endure. If this were true, we should probably see more terrorism in autocratic states, but this is not the case.

[11] Data descriptive statistics suggest that in some cases groups in more autocratic states have higher failure rates, when state capacity is held constant. There is not a clear bivariate relationship between regime type and group failure, but the literature suggests terrorists generally find democracies advantageous for operations.

[12] Terrorist groups could be less likely to form alliances in autocracies, due to difficulties of operating in such states. This could suggest an endogeneity problem; results could be exaggerated in autocracies. However, in a separate study, I explore determinants of cooperative relationships, and regime type is never statistically significant (Phillips 2012). Similarly, state capacity is generally not associated with alliance formation or count. In the present study, the variable measuring cooperative ties is virtually uncorrelated with either regime type or capacity, around 0.10. This suggests cooperation is exogenous to regime type and capabilities; it is not substantially more common in dictatorships or democracies, weak states or strong states.

[13] This sample comes from a slightly larger data set, but some terrorist groups or years in the data set are not used in models in the paper because of missing state-level data. Some models in the online Appendix S1 using alternate state-level variables have a higher number of observations and groups, but results are basically unchanged.

[14] Their data are largely based on the RAND-Memorial Institute for the Prevention of Terrorism (MIPT) Terrorism Knowledge Base database. These data are now hosted by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland.

because finding yearly data is unlikely, due to the clandestine nature of terrorism. These two time periods are interesting because the former is during the Cold War, and the latter represents the religious era of terrorism. I assume, for the purpose of these models, that terrorist group attributes in the late 1980s remain constant through the early- and mid-1990s, until the next data wave begins. This is not ideal, but it offers an advantage over data that assume terrorist group attributes do not ever change (for example, Jones and Libicki 2008; Cronin 2009; Blomberg et al. 2010).[15]

The terrorist group data come from two time waves, but because groups begin and end in specific years, the data set is structured as group-year.[16] Most group attributes can only vary once because they are only recorded for the two time periods. However, there is yearly variation in the variable *allies* when groups form or end and therefore enter or leave the data. For example, if two groups are cooperating in the late 1980s, but one of the groups ends in 1992, the relationship is coded as ending that year. The surviving group is coded as *not* in that relationship from 1993 onward.[17]

To determine which groups existed in the late 1980s, I first examined Asal and Rethemeyer's data, which contains group "age," to determine which groups were extant as early as 1987. I then checked other sources, primarily the Terrorist Organization Profiles (TOPs)[18] and the Global Terrorism Database (GTD) terrorist incident data set.[19] These are the most commonly used sources for terrorist group data (for example, Jones and Libicki 2008; Cronin 2009). I also checked Jones and Libicki's data (2008), although they largely rely on TOPs.[20]

Figure 1 shows a snapshot of the relational portion of the data and how it changes with time. In each time period network, there is one "primary component" or dominant sub-group of interconnected terrorist groups, located on the right side (Wasserman and Faust 1994, 109–110). In the 1987–1989 network, the primary component is rather loosely interconnected. This cluster includes mostly Middle Eastern and Latin American groups, with European groups as well. In the 1998–2005 network, the primary component mostly involves Asian and Middle Eastern groups. It is more densely connected, in a "core-periphery" form (Carrington, Scott and Wasserman 2005, 68). The group at the center is al-Qaeda. The comparison of the two time periods corresponds to Rapoport's (2004) notion of a shift from one type of terrorism to another in the 1990s. Leftist groups described by Rapoport as the Third Wave gave way to religious groups, the Fourth Wave, as the dominant terrorists.[21]

In spite of interesting differences between the time periods, there are patterns common to each. In both periods, there are many groups with ties, and a subset of the groups has many ties. Also, contrary to the notion of increased globalization in the 1990s, terrorist groups have about the same amount of connectedness, on average, regardless of time period. The average group in each period has 1.2 allies. Overall, the figures show some interesting changes across time—suggesting the importance of gathering data at multiple periods—but similarities as well.

Variables and Estimator

The dependent variable is *group end*. It is coded 1 in the year that the terrorist group ended, if it ended during the sample. A terrorist group has "ended" when it has either ceased to exist as an organization or has given up terrorism as a tactic even if it remains a group (Cronin 2009, 210). An example of the first scenario is the Japanese Red Army, which disbanded in 2001 after police arrested most of its members. An example of the second situation is the Provisional Irish Republican Army, which gave up terrorism in 2005.[22] As Cronin and others detail, terrorist groups can end as an organization or give up terrorism through a variety of means, such as defeat by police, entering nonviolent politics, or becoming marginalized.[23] My sources for group end dates include TOPs, the GTD, news sources, and other terrorist group data sets (for example, Jones and Libicki 2008; Cronin 2009). In the absence of any of the above, and again following Cronin, I use the year of the final reported terrorist attack of the group in the GTD. The average group in the sample reaches an age of 10.7 years.[24] There is considerable variation, as many groups only last a few years, and the most durable group has been the Ku Klux Klan.[25] A majority of the groups, 368 (61%), end at some point between 1987 and 2005.

All terrorist group attribute variables are based on variables from Asal and Rethemeyer (2008). For years before 1998, these variables are coded using the sources described above for other terrorist group information, including TOPs and newspaper archive searches. The Lexis–Nexis database was searched for all news articles about each group. These open sources contain a great deal of information about terrorist groups, as terrorists almost by definition publicize their acts—including, often, with whom they

[15] Results for hypothesized relationships hold when the sample is split into subsamples, 1987–1997 and 1998–2005. See online Appendix S1.

[16] Information on temporal variation of variables is summarized in a table in the online Appendix S1.

[17] If cooperative tie counts are constant for the two periods (period maximum), removing yearly variation, results are similar although goodness of fit slightly declines.

[18] The TOPs, like the GTD, are hosted by START and are available here: http://www.start.umd.edu/start/data_collections/tops/.

[19] The GTD has relatively liberal criteria for terrorist attacks, so I exclude some groups if they appear to only attack military targets in a war environment. This is consistent with the group coding of Cronin (2009) and others. Additionally, some of the groups included appear to be "one-hit wonders," and some authors exclude groups of this type. However, I include groups even if they only have a single attack in a terrorist incident data set due to the incomplete nature of attack data. For example, there are groups with attacks described in their TOPs profile or other sources, but those same attacks do not appear in the GTD attack data. Removing short-lived groups also biases the sample. Regardless, removal of "one-hit wonders" does not substantially affect results.

[20] I thank Martin Libicki for sharing this data.

[21] See also Juergensmeyer (1993), who described a "new Cold War" involving religious nationalists vs. secular states.

[22] Sometimes groups say they will give up terrorism, but relapse. Like other researchers, I consider these groups still active. The IRA declared to give up terrorism in 1994, 1998, and 2005, but is only coded as ending in 2005 because terrorism followed previous declarations. One advantage of the data ending in 2005 is the time to see if a group relapses. If a group is dormant and then re-activates, I consider the group to have existed for the entire time.

[23] Regarding splintering, I do *not* code a group as failing if part of it splinters off to form a new organization, as long as the original rump group maintains its same name. If no same-named organization remains, the group has failed.

[24] This number is the mean of the maximum age of groups during the sample.

[25] Following others (for example, Jones and Libicki 2008; Cronin 2009), the Klan is coded as reaching the age of 140 in 2005. Results are unchanged if this outlier is excluded.

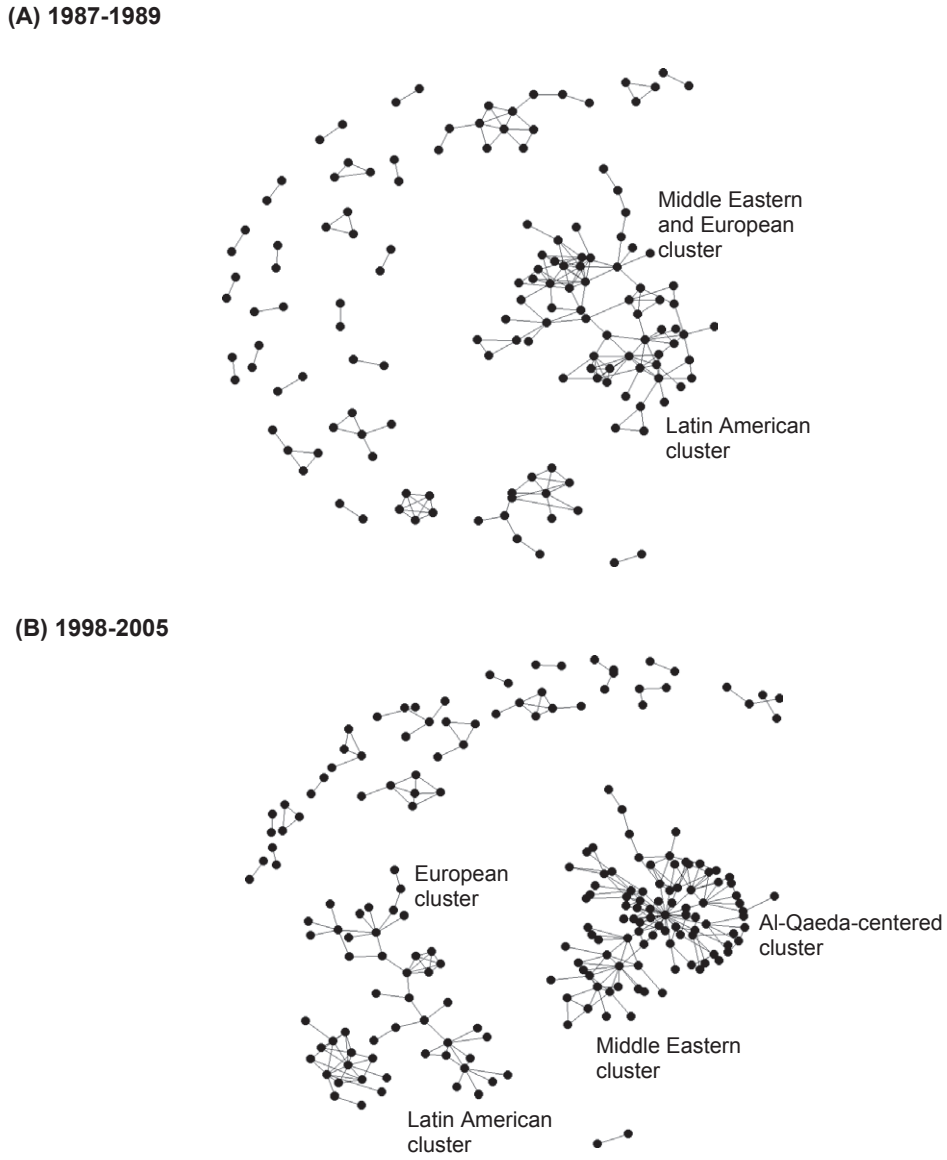

Fig 1. Terrorist Group Cooperative Ties in Two Different Periods. Created in UCINET NetDraw, with Gower Metric Scaling, Equal Edge-Length Bias, and Node Repulsion. Groups Without Ties are not Shown

act. For many groups, every article about them in Lexis–Nexis during the period was analyzed. For prominent groups, more targeted searches or books were used. These variables are coded according to Asal and Rethemeyer's codebook (Anderson, Asal and Rethemeyer 2009), although the variable *allies* is changed somewhat to reflect the concepts described in my argument. Gathering data on terrorist groups poses a number of challenges (for example, Crenshaw 1991, 75; Sandler 1995), but consulting so many sources—news media, qualitative analyses, the best available databases—helps mitigate problems.

Hypothesis 1 is tested with *allies*. This is a count variable measuring for each group the number of its cooperative allies. A terrorist group is considered to be in a cooperative relationship with another terrorist group if a source indicates the groups have logistically or operationally cooperated. This refers to sharing resources (including joint training) and joint attacks.[26] This is consistent with Karmon's (2005) material notion of cooperation. He argues that logistical and operational cooperation are important and excludes expressions of solidarity as being insufficient to consider cooperation. Similarly, I do not include expressions of solidarity, as they should not be important for mobilization. *Allies* is a non-directed measure, meaning partners in a relationship are coded regardless of who is helping whom more (Wasserman and Faust 1994, 72–75). Sources are the same as for other group variables, including news archive searches. The coding of *allies* for 1998 and later relies substantially on Asal and Rethemeyer (2008) group alliance or positive relationship measure.[27] *Allies* ranges from 0 to 33. The group with 33 ties is al-Qaeda.[28] All other groups have 12

[26] For examples of evidence use to classify groups as cooperating, see the online Appendix S1.

[27] My concept of cooperation is more specific than their "positive relationships" variable, so I start with that variable for 1998 onward, but un-code groups that only, for example, were coded for "supported cause" of another group, according to TOPs.

[28] If al-Qaeda is removed, results hold. Missing data for Afghanistan causes some al-Qaeda years to drop, but these years are included in models in the Appendix S1 and results hold.

or fewer allies, and the average group has 1.2. *Allies* should be negatively related to *group end*.

Hypothesis 2 is tested with *allies' ties*. This captures the eigenvector centrality value, which measures not only a terrorist group's allies, but the number of cooperative ties that its allies have as well. Bonacich (1987) describes eigenvector centrality as a unit's "summed connections to others, weighted by their centralities."[29] The variable is calculated in UCINET (Borgatti, Everett and Freeman 1999). It is created using the network of relationships illustrated in Figure 1, with one network matrix for 1987–1989 and another for 1998–2005. This variable is group-period and does not change yearly since there are not matrices constructed for each year. The variable ranges from 0 to 0.620, with a mean of 0.018. The group with the highest value is al-Qaeda.[30]

Allies and *allies' ties* are substantially different measures. For example, the Islamic Movement of Uzbekistan has only two ties, which is near average for *allies*. However, its *allies' ties* score (0.111) is well above average, because its ties are to al-Qaeda and the Taliban. A group with a high value for *allies* and a low value for *allies' ties* is the Ulster Defense Association. Its allies were local groups with few or no other ties. These examples suggest that *allies* and *allies' ties* capture different concepts.[31]

To test Hypotheses 3 and 4, *allies* is interacted with measures of state capacity and regime type for the state in which the group primarily operates. *Capacity* is estimated using the Government Effectiveness Estimate index from the World Bank governance indicators, and available through the Quality of Government project (Teorell, Samanni, Holmberg and Rothstein 2011). It is missing values for many years, so I use the average value of available years for each country between 1987 and 2005. The variable ranges between −2 and 2.2.

The index used for *capacity* includes attributes such as bureaucratic quality and competence of civil servants. Measuring counterterrorism capacity in this manner is important because Hendrix (2010) finds bureaucratic and administrative capacity to be a fundamental measure of state capacity, at least for the study of civil conflict. Unfortunately, we do not have a more specific measure of counterterrorism capabilities. Measures of law enforcement or legal capabilities do not exist for many developing countries and could be endogenous to the terrorist threat itself. Measures of "capability" used in research on international war are not well suited for indicating counterterrorism capability.[32] The military is only one component of counterterrorism and is usually a minor component.[33]

The Government Effectiveness Estimate index is not an ideal measure, so I also test alternative measures such as gross domestic product per capita (GDPPC), but results are similar. GDPPC is often used to indicate state capacity (Carter 2012), but could also proxy concepts such as economic grievance (Hendrix and Young 2012). To test Hypothesis 4, I use *regime type*, measured by the Polity2 index, where −10 is fully autocratic and 10 is fully democratic (Marshall and Jaggers 2002). The mean is 6. Results with Freedom House are similar and shown in the online Appendix S1.

Control variables generally come from Asal and Rethemeyer (2008) for 1998 and later. I coded them for earlier years with sources described above, such as systematic searches of every newspaper article on the group during the period. *Ethnic motivation* and *religious motivation* are dichotomous measures indicating groups that have goals related to ethnicity or religion, respectively. These types of goals should help more with mobilization than a group being, for example, left-wing generally (Hoffman 2006, 242–243; Jones and Libicki 2008; Carter 2012). About 37% (219) of the groups are coded for *ethnic motivation* and about 23% (136) for *religious motivation*. Each should be negatively related to *group end*.

Drugs is dichotomous and indicates involvement in production or sale of illegal narcotics. It was coded using the same sources as those for other group variables. Around 8% (49) of the groups are coded for involvement in drugs. *Drugs* should be negatively related to *group end*, as additional income should help groups fund operations and therefore survive (Piazza 2011). *State sponsored* is also dichotomous and indicates material support from a state. Groups that have a state sponsor should generally be less likely to end than other groups, in spite of potential negative consequences of sponsorship (Carter 2012). To code *state sponsored*, I consulted Byman's research (2005, 2008) and sources discussed above. About 18% (106) of the groups are coded for this variable at some point in the sample, the same percentage that Carter found to be state sponsored.

Group size is an approximation of the number of members in a terrorist group. It is coded 0 if the group has fewer than 100 members, 1 if the group has between 100–999, 2 if the group has 1,000–9,999, and 3 for the few groups with 10,000 or more members. This categorical measure is the best available given the scarcity of information on terrorist group size (Asal and Rethemeyer 2008; Jones and Libicki 2008). As with other group variables, it is coded for the two time periods, so it can vary with time. *Group size* should be negatively related to *group end*.

Regarding state attributes, each terrorist group is coded for the state in which it primarily operates.[34] Models 1–3 include *capacity* and *regime type,* described above, as controls. I expect terrorist groups in more capable countries to not last as long because of counterterrorism potential (Young and Dugan 2010; Carter 2012). *Regime*

[29] For more specific parameters, see Bonacich (1972). For further discussion, see Bonacich (2007).

[30] The high eigenvector scores for al-Qaeda occur in the post-1997 portion of the sample. In earlier years, Colombia's April 19 Movement had the highest value.

[31] While the concepts are different, the variables are correlated at 0.51.

[32] The Correlates of War's capabilities index (CINC) includes population, military size, and other factors that likely have little to do with counterterrorism. Some studies find CINC positively associated with terrorism (Li 2005; Chenoweth 2010). CINC is correlated with population; India has a much higher CINC value than Israel or most European states. This is not consistent with my notion of state capacity. However, due to its common usage, it is included in models in the online Appendix S1. CINC is positively signed, but only statistically significant in Model 1. Its inclusion does not change results of *allies* or *allies' ties*. Regarding graphed results of *allies* × *capacity*, the slope of the line is similar, but it is statistically insignificant at higher levels of state capacity. This could be related to states such as India with high CINC values, but relatively weak counterterrorism capabilities.

[33] Policing defeats far more terrorist groups than does military action (Jones and Libicki 2008). If military spending per capita is included in models, it is never statistically significant and does not affect results in Models 1–3. The effect of *allies* is not conditional on military spending.

[34] Although many groups carry out transnational attacks in addition to domestic attacks, the vast majority of groups *primarily* operate in a single state. An important exception is al-Qaeda, which has operated globally. Models without al-Qaeda return similar results (see online Appendix S1).

type should also be negatively related to *group end*, as more democratic countries are constrained in their ability to fight terror (for example, Li 2005). *Population*, a natural logarithm, is also included. This comes from the Penn World Tables. It should be negatively related to *group end*, because terrorist groups can hide better in larger populations (Blomberg et al. 2010). Models include regional dummy variables.

Hypotheses are tested using a discrete-time survival model. This model is used because there are time-varying covariates, and the data are structured as group-year. This means there are discrete intervals in time, even though a terrorist group can end at any point during the year. Discrete-time models are a suitable means of analyzing such data (White 1992; Box-Steffensmeier and Jones 2004), and recent studies of terrorist group survival with time-varying data have used such models (Blomberg et al. 2011; Carter 2012). The model is basically a logistic regression that also takes time into consideration. Cubic splines are included (Beck, Katz and Tucker 1998). Decade or year dummies instead of splines do not change results.

Another common approach for modeling failure with time-varying covariates is the Cox proportional hazards model (Box-Steffensmeier and Jones 2004). Diagnostic tests suggest that this model is not appropriate for my data because the proportional hazards assumption does not hold. If the Cox model is used, however, results are similar to those obtained using the discrete-time model.

Because the unit of analysis dictates that each terrorist group is measured repeatedly (each year), the standard errors are likely not independently and identically distributed (Woolridge 2003; Zorn 2006). To address this "group effects" problem, I cluster the standard errors by terrorist group. For a more rigorous test of the hypotheses, I cluster robustly (Zorn 2006).

Findings

Table 1 shows results of the models explaining terrorist group failure and its inverse, survival. Model 1 is a baseline model, showing the effects of control variables only. This is discussed below. Model 2 includes the measure of cooperative relationships. *Allies* is statistically significant and negative, suggesting that for each additional cooperative relationship that a terrorist group has, it has less likelihood of ending that year. This suggests support for the first hypothesis. Substantive effects are shown in Table 2. If a terrorist group goes from zero allies to one ally, with other factors held at their means, the group's probability of ending that year decreases by 38%. This is comparable to the impact of a change in group membership size, or the difference between ethnically motivated groups and groups that are neither ethnic nor religious. Cooperative relationships substantially help terrorist groups survive.[35]

Model 3 shows the inclusion of *allies' ties*, the measure of how well connected are the groups with which a terrorist group has cooperative ties. The variable is statistically insignificant. Hypothesis 2 is not supported. This suggests that the number of relationships matters more than to whom one is connected.[36] The lack of significance for *allies' ties* could occur because more well-connected groups might be occupied cooperating with so many groups that they cannot devote much attention to every single ally, and therefore, there is less resource sharing. A relationship partner with no other connections, however, should be likely to focus substantial attention on its lone tie.

The difference in significance between *allies* and *allies' ties* is interesting because Horowitz and Potter (2013) find basically the opposite result in a study of terrorist group lethality: a group's count of relationships does not seem to affect its lethality, but its eigenvector centrality does. One explanation is that a connection to a well-connected group might help an organization carry out a few extremely lethal attacks, but this does not necessarily ensure years of vitality for the group.[37] Eigenvector centrality has been shown to be important for many types of networks (for example, Borgatti 2005), but has barely been considered in the study of terrorist groups, so it is worth further investigation.

Model 4 shows the test of interaction terms representing Hypotheses 3 and 4. These hypotheses suggested that the impact of *allies* is conditional on state capacity and state regime type. The coefficients for the interaction term variables in Model 4 are not directly meaningful, as they do not show the values of *allies* at all levels of *capacity* or *regime type*. The conventional solution is to compute the combinations of the interactions and their component terms and graph the results (Braumoeller 2004), as I do in Figures 2 and 3.

Figure 2 shows the impact of *allies* on *group end*, conditional on different levels of *capacity*. Cooperative ties have a more substantial negative impact at higher levels of state capacity, consistent with Hypothesis 3. Substantive significance is calculated with marginal effects. In the most capable states (*capacity* = 2), the effect of one additional ally on a group's likelihood of ending is three times that of the effect in a state on the lower end of the capability scale (*capacity* = −1). States with the highest capability values include the United States and Western European countries. States with a capability value of close to −1 include India, Lebanon, and the Philippines. Interestingly, in the least capable countries (*capacity* < −1), *allies* is statistically insignificant. This is only a handful of countries in the sample, such as Sudan and the Democratic Republic of Congo. This suggests a caveat to support for Hypothesis 1, the notion that cooperation generally helps groups survive. However, the result is consistent with Hypothesis 3, the idea that cooperative ties matter more in states with greater capacity. Groups in a weak state need less help fighting the government, so they do not benefit as much from cooperative ties.

Figure 3 shows the impact of *allies* on *group end*, conditional on different levels of *regime type*. Cooperative relationships have a greater substantive impact in more autocratic countries, consistent with Hypothesis 4. The

[35] Results do not appear to be a function of endogeneity. It could be that larger or older groups are more likely to have allies, and these types of groups are driving the *allies* result. However, if the models are run on samples of only younger or smaller groups, results hold. Furthermore, *allies* is not substantially correlated with *group size* or group age in years.

[36] If *allies* is excluded from the model, *allies' ties* is statistically significant and negative. However, the goodness of fit of the model is worse, similar to the baseline model. I include the variables together because I think of them as complements, not substitutes.

[37] There could be disadvantages to highly connected ties. Bonacich (1987, 1170–1171) argues that an actor's bargaining power is reduced if he is interacting with higher-power (more connected) actors. However, while we may speculate about why the coefficient is statistically insignificant, we cannot say with confidence that there is any relationship, positive or negative, between eigenvector centrality and group failure.

TABLE 1. Logit Discrete-Time Models of Terrorist Group Failure

	Model 1 *Baseline model*	*Model 2* *Allies*	*Model 3* *Allies' ties*	*Model 4* *Interactions*
Allies		−0.521 (0.080)***	−0.539 (0.081)***	−0.806 (0.154)***
Allies' ties			1.206 (2.781)	
Allies × *Capacity*				−0.253 (0.115)**
Allies × *Regime type*				0.046 (0.119)**
Group size	−0.647 (0.102)***	−0.421 (0.105)***	−0.422 (0.105)***	−0.443 (0.105)***
Religious motivation	−0.275 (0.227)	−0.175 (0.223)	−0.188 (0.227)	−0.165 (0.224)
Ethnic motivation	−0.581 (0.176)***	−0.531 (0.169)***	−0.526 (0.169)***	−0.509 (0.172)***
Drugs	−0.450 (0.248)*	−0.436 (0.263)*	−0.436 (0.263)*	−0.365 (0.259)
State sponsored	−0.630 (0.209)***	−0.359 (0.217)*	−0.349 (0.220)	−0.308 (0.221)
State-level factors				
Capacity	−0.184 (0.130)	−0.150 (0.124)	−0.150 (0.124)	−0.038 (0.138)
Regime type	0.020 (0.020)	0.030 (0.020)	0.031 (0.020)	0.011 (0.022)
Population (log)	−0.345 (0.069)***	−0.308 (0.066)***	−0.310 (0.066)***	−0.312 (0.066)***
Log pseudolikelihood	−1013.658	−969.263	−969.111	−964.759
N (groups)	3,922 (600)	3,922 (600)	3,922 (600)	3,922 (600)
BIC	2,168	2,087	2,095	2,095

(*Notes.* Dependent variable is *group end.* Robust standard errors shown in parentheses clustered by terrorist group. Regional dummies and cubic splines not shown. Statistical significance: *$p < .1$, **$p < .05$, ***$p < .01$.)

TABLE 2. Substantive Effects of *Allies* and Other Selected Variables

Variable	*Change*	*Probability of group end* at each level	*Change in probability of group end*
Allies	0 → 1	0.091 → 0.056	−38%
Allies	0 → 2	0.091 → 0.034	−63%
Group size	0 → 1	0.067 → 0.045	−33%
Ethnic motivation	0 → 1	0.057 → 0.034	−40%

(*Notes.* Values calculated using marginal effects, results from Model 2 of Table 1, and with other variables held at their means. *Size* 0 = fewer than 100 members. *Size* 1 = 100–999 members.)

impact of an additional ally in a fully autocratic country such as Saudi Arabia is estimated to be about two and a half times that in a democracy such as the United Kingdom or Japan. The relationship between *allies* and *group end* is statistically significant at all levels of *regime type.*

A note about the two interaction results: State capacity and regime type are usually positively correlated. Because of this, we might expect these state attributes to condition intergroup ties in the same direction. It would be less remarkable if cooperative ties had their greatest impact in capable states *and* democracies. The fact that this does not occur, however, suggests that there are important differences between how capacity and regime type affect terrorist groups, in spite of the correlation between them.

Regarding control variables, *group size, ethnic motivation,*[38] and *population* are statistically significant and nega-

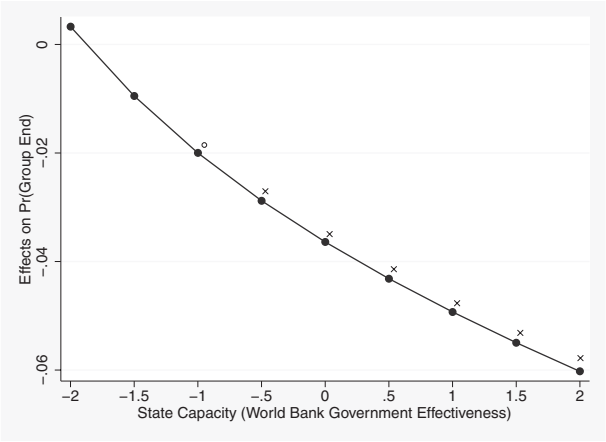

FIG 2. Marginal Effect of *Allies* on *Group End*, Conditional on State *Capacity.* Note: x = $p < .01$, o = $p < .1$

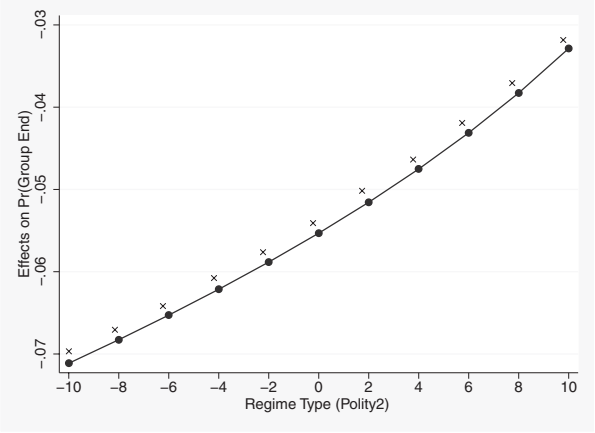

FIG 3. Marginal Effect of *Allies* on *Group End*, Conditional on State *Regime Type.* Note: x = $p < .01$

[38] When reference categories are rotated, results suggest a lack of difference between ethnic and religious groups. If *ethnic* is the reference category, *religious* is insignificant. A variable measuring non-ethnic and non-religious groups is significant and positive, suggesting these groups are more likely to end than ethnically motivated groups. If *religious* is the omitted category, *ethnic* is statistically insignificant, again suggesting a lack of difference between the two types. The non-ethnic non-religious variable is insignificant when *religious* is the omitted category. Overall, the reported result for *ethnic* and non-result for *religious* should be taken with caution and are worth future study. Changes of group motivation variables do not affect hypothesized results.

tive in all models. These factors are negatively associated with group failure, consistent with other research. However, *religion* is never statistically significant. The lack of a relationship is surprising because some studies find religion to explain terrorist group longevity (Blomberg et al. 2011), although others find mixed results (Carter 2012). When Freedom House is used instead of Polity (see online Appendix S1), *religious motivation* is statistically significant, but only at the $p < .10$ level in Models 2–4.[39]

Neither *drugs* nor *state sponsored* is statistically significant in all models. *Drugs* is negatively signed and significant at the $p < .10$ level in Models 1 through 3. The lack of robust relationship could be because of a mixed impact on group survival. The drug business can help with funds, but could draw negative state attention. *State sponsored* is negatively signed, highly statistically significant in Model 1 but significant at $p < .10$ in Model 2 and then insignificant.[40] Carter (2012) suggests that sponsorship has a complicated relationship with group endurance and can help or harm terrorist groups depending on circumstances. The lack of a result in fully specified models is consistent with the idea of a mixed impact.

Neither *state capacity* nor *regime type* is statistically significant when included in the unconditional models, Models 1–3. This is somewhat surprising because these factors are said to be associated with terrorism generally. However, these non-results for some state-level variables are consistent with the notion that terrorist group survival is better explained by attributes of the terrorist groups. The argument of this paper is that state attributes are more important for their ability to condition terrorist group attributes than on their own.

Regional controls (not shown) suggest a terrorist group in North America is less likely to end than one in Europe (the omitted category), although this is significant at the $p < .10$ level and insignificant in Model 1. *Latin America* is negatively signed, but is only significant in Model 1 at the $p < .10$ level and insignificant elsewhere. A terrorist group in Subsaharan Africa is less likely to end than one in Europe, according to Models 2–4. The results for *Middle East* and *Asia* are the most robust, with a group in either region consistently estimated to be less likely to terminate than a group in Europe.

Goodness-of-fit measures suggest that the model substantially benefits from considering cooperative relationships. Bayesian Information Criterion (BIC) scores indicate that Model 1 has the worst fit, while Model 2 has the best. Models 3 and 4 have BICs similar to Model 2's. The receiver operating characteristics curve (not shown) illustrates the model's predictive ability, plotting true positives plotted against false positives (Fawcett 2006; Weidmann and Ward 2010). This returns a value, the area under the curve (AUC). An AUC of 1 would imply the model perfectly predicts every terrorist group failure. A plot of Model 2 returns an AUC of 0.82, while removing *allies* from the model drops the AUC to below 0.80, a statistically significant difference. This decrease is more substantial than that which occurs after the removal of any other single independent variable from Model 2. Models 2, 3, and 4 have similar AUCs (all round to 0.82), but Model 4 has the highest.

The results for the models are robust to a number of changes, some of which are mentioned above. If alternate measures of variables are used, such as Freedom House instead of Polity, or GDPPC instead of the Government Effectiveness Estimate, results for hypothesized relationships hold, including the graphing of interaction terms. If alternate estimators instead of the discrete-time model are used, such as a Cox model, results hold.

Conclusion

This paper asks why some terrorist groups last longer than others. The question is both important and unanswered. The results suggest that cooperative relationships between terrorist organizations are an important part of terrorist group survival. Furthermore, the paper showed these ties matter more in certain types of states. Cooperative relationships have a greater substantive effect in more capable and in more autocratic states, because terrorist groups face challenges in these environments, and the benefits provided by cooperative ties are especially important for groups' survival in challenging conditions.

The results offer important contributions to the study of terrorism. This paper presents the first interorganizational model of terrorist group survival. Explanations thus far have assumed that terrorist groups operate independently, but this study shows that relationships between terrorist groups have important consequences. Bringing interorganizational elements into the study of terrorism, as few other authors have done (for example, Asal and Rethemeyer 2008; Horowitz 2010), provides a deeper foundation for understanding terrorist organizations.

The results suggest implications for counterterrorism. Cooperation can help terrorist groups survive, so eliminating one terrorist group is likely to have consequences for its partners. If a state is unable to disarm one group, it could focus on its allies, as this is likely to adversely affect the original target group. Consequences, however, will probably depend on state attributes. Interestingly, results indicate the number of allies a group has is more important to its survival than how well connected those allies are. This suggests that governments should be concerned about any terrorist group connections, and not only if a group is aligned with a highly connected group such as al-Qaeda. In addition to theoretical and policy contributions, this project extends global data on terrorist group ties back into the 1980s.

Future research can proceed in a number of directions. One potential related project is the study of the determinants of relationships between terrorist groups in the first place. Another possibility involves the specific ways that cooperation helps terrorist groups. The argument of this paper is that intergroup ties help terrorist groups endure through multiple mechanisms—the sharing of resources including information and weapons, and through more effective attacks, which helps with recruiting and other critical functions. Which mechanism matters more? The tests conducted here do not distinguish between them, but it would be interesting to explore this question further. Finally, which other interorganizational attributes have important consequences? This project studied counts of cooperative ties and eigenvector centrality, but potential next steps include analyzing alternate measures, or different relationship types. The terrorism literature

[39] *Religious motivation* is basically uncorrelated with *allies*, at 0.10.

[40] Diagnostics indicate there is not a multicollinearity problem. *State sponsored* is not substantially correlated with any other independent variables. It is only correlated with *allies* at 0.22.

has said little about the causes, structure, and consequences of terrorist group relationships, so continued research is important.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Additional material for "Terrorist Group Cooperation and Longevity".