BITTER FRIENDS: HOW RELATIONSHIPS BETWEEN VIOLENT NON-STATE ACTORS FORM, ARE USED, AND SHAPE BEHAVIOR

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ABSTRACT

Most militant groups do not act in isolation. They exist in a vast web of partnerships which help them to mobilize resources, learn, and survive. But partnerships can also be costly in terms of time, risk, and autonomy. This dissertation examines the cooperative network among violent actors. How do groups select their partners? How do groups use their partnerships to enhance their own capabilities? What are the ways in which certain patterns of partnerships help or constrain groups?

Transnational Sponsorship of Local Groups: Violent transregional organizations operate in multiple conflicts, and have an inherent interest in extending their reach into new territories. They do this by sponsoring local actors in local conflicts. I find that transregional groups prefer strong local affiliates that can provide secure access to territory and strong command and control. Strong local actors do not need sponsorship, and prefer autonomy. Partnership only occurs when the local group needs access to transregional networks or legitimacy provided by the transregional group. This can backfire for the transregional group when the local group becomes strong enough to create their own network and become a competitor, as occurred with al Qaeda with al Qaeda in Iraq.

Structure of Violent Networks: The structure of the violent group partnership network shapes the ways that goods and vulnerabilities flow between groups. More centralized local networks with well-connected groups at the center and poorly connected groups at the periphery are
efficient because the central group can specialize in distributing contextualized information and screening members. Flatter local networks lack coordination. I find that more centralized networks produce greater lethality and survivability among members.

Diffusion of Violent Tactics: Violent actors need to adapt in order to survive, but adopting new tactics can be costly. Groups rely on partners in order to reduce the costs of learning new tactics on their own. Moreover, more centralized networks, networks with few well-connected groups and many groups with few partners, better facilitate the spread of tactical information. Competition among groups increases the need to adapt, encouraging innovation.
A handful of mentors shaped this work in profound ways. Dan Byman has kept me grounded, and helped make my work more comprehensible. Desha Girod has always been there with professional advice and encouragement, and there to help me think through my approach. Erik Voeten has provided an outside eye, challenging core assumptions and making me radically re-think my approach to many questions. Victor Asal has been a mentor and an advocate. He encouraged me to push through the dissertation, did what he could to help, and has introduced me to half the field. Without Victor's mentorship, I would not feel so at home in International Relations and Security Studies. I also want to thank Skyler Cranmer, who has given me some of the best professional advice, and without whose support I could not have finished. He has helped nudge me in the right direction past hurdles where I might still be otherwise still be stuck.

The journey that lead to the completion of this document began long before my enrollment at Georgetown. I've known that I would pursue a PhD since before I can remember. After all, my mother was a Doctor, and she was the smartest person in the world, and I wanted to be too. At the time, I was going to be a biochemist. And as I got older and learned what biochemistry was, that focused to molecular biology, and then neuroscience. And I spent a lot of time doing science fair and then working in a lab toward that goal. Early on, my mother helped me with my science fair projects as I began my dance with the scientific method. And then in high school, Julie Carroll took me under her wing to teach me technique and give me lab space to do my research.

But all the while, I had a fascination with politics, power, and war. I grew up on stories of the Afghan Civil War. I read Dune in middle school, and was captivated by the idea of politics and war as a science. And then I got to college, and found out that political science was a real thing that I could study. I double majored, expecting political science to be my secondary major, a hobby to feed the fascination I'd always nurtured.

I was in lab one day when my advisor, Yingxi Lin, called me into her office. Yingxi was an amazing mentor who pushed my relationship with certainty and the scientific method to a new level and gave me the first introduction to what I would later call the EITM approach. She taught me how to look for evidence for something that cannot necessarily be observed directly, in as many contexts as possible. One day she called me into her office and asked me what I wanted to do, and if she should be preparing me for a neuroscience PhD, then added: "but your eyes light up when you talk about your political science research." And she was right. She encouraged me to pursue my passion, even if it meant giving up the known path, and turning to a different field.

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After graduating I went to work with the DoD, and then the Institute for Defense Analyses. I
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With Heartfelt Gratitude,
Laila A Wahedi
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CHAPTER I
BLOODY BENEFACTORS: TRANSREGIONAL TERRORIST SPONSORSHIP IN CIVIL WARS

1.1 INTRODUCTION

Some rebel groups receive the aid of transregional actors, while others don't. Why were Hekmatyar’s Hezb-i-Islami, and later the Taliban, able to successfully attract al Qaeda support during the Afghan civil war, while Massoud’s Jamiat-i-Islami was not? Why did the Algerian resistance group GSPC seek support from al Qaeda, while their predecessor, GIA, did not? Why has al Shabaab solicited al Qaeda’s support, while Jaish al Islam and Hamas have resisted? Why did al Qaeda initially reject al Shabaab’s request, and later provide support? What explains this variation in transregional sponsorship in civil wars? This puzzle has two distinct parts that are often in tension. Which rebel groups do transregional groups want to support? Which rebel groups want sponsorship?

In this paper, I develop a theory to explore (1) the tradeoffs that transregional terrorist groups make when deciding whether to intervene in a local war, and which group to sponsor; (2) the tradeoffs made by the sponsored groups when deciding whether to accept or solicit sponsorship from the transregional group; and (3) when tensions between the two can be resolved. I argue that transregional groups prefer to invest in local affiliates that are strong enough to provide secure access to territory, and have strong enough command and control over their sub-units to effectively carry out strategic operations. Strong local groups, however, don’t need transregional group support, and are unwilling to trade sovereignty and independence for any support the transregional group could offer. This creates a tension which is resolved when relatively strong local groups require goods that they cannot access themselves, but that transregional groups can provide. This occurs when strong local groups are in decline, or lose access to a resource critical
to their survival. Understanding this tradeoff will help us to understand when local insurgencies are likely to become internationalized, and to exploit tensions in these partnerships.

The theory is informed by insights into al Qaeda's sponsorship decisions provided by captured documents, jihadist publications, secondary source interviews with top al Qaeda officials and members of sponsored organizations, and news and intelligence reports. Captured documents include those taken from Osama bin Laden’s compound in Abbottabad, and the Harmony database, which contains documents captured by the US government during operations in Iraq, Afghanistan, and elsewhere. These documents, along with other primary source material, provide insights into the decision-making process used by al Qaeda and their sponsors. Throughout the paper, I will motivate the theory with vignettes and examples obtained from these documents.

In section 1 I will describe the scope conditions by defining transregional groups and local groups. In section 2 I outline competing hypotheses drawn from the literature. In section 3 I outline my hypotheses. In section 4 I describe my methods. The following sections contain case studies on al Qaeda in Afghanistan, Algeria, Somalia, Sudan, and Chechnya. I conclude with a note on The Islamic State in Iraq and the Levant (ISIL), how their provinces differ from al Qaeda’s franchises, and what the theory tells us to expect.

1.1.1 Transregional and Local Groups

Transregional terrorist groups are classified here as any groups that have an interest in expanding their area of operation or influence beyond a single local conflict. This interest may arise from policy goals which transcend a single locality, or because they are interested in seeding sympathetic governments in nearby regions. My definition is distinct from traditional
definitions of transnational groups. Traditionally, any group that carries out attacks either in the territory of more than one state, or against the nationals of more than one state, is classified as transnational.\(^a\) State boundaries, however, do not perfectly correspond to conflict boundaries. The traditional definition therefore classifies groups according to contextually arbitrary geographic lines, rather than based on the geographical dispersion of their interests. My definition solves this problem by classifying groups based on the nature of their goals.

To illustrate the distinction between transnational and transregional groups, consider two groups with contiguous territory that conduct attacks across state lines: the PKK and AQIM. Both are transnational groups because they carry out attacks in multiple countries. Only AQIM is a transregional group, however. The PKK has highly localized interests that pertain to a single, mostly unchanging territory. AQIM, on the other hand, is interested in expansion, and involves itself in many localized conflicts. For example, it focuses many of its attacks in Algeria, but also supported the Tuaregs in their rebellion against the Malian government.

A group can also be transregional while only acting within the boundaries of a single country if it is interested in gaining territorial access across multiple localities. For example, national and international umbrella skinhead organizations operate across different locations, with support from independent and competing chapters that are based in local communities. Several of these umbrella organizations have existed solely within the US, but still follow a similar pattern to other transregional terrorist groups.

Transregional groups are theoretically distinct from local violent actors because of their interest in territorial expansion. Civil wars in undergoverned territories provide an opportunity

\(^a\) See, for example, (Sandler & Enders, 2004).
for terrorist groups to expand their reach (Watts, Shapiro, & Brown, 2007). One way to expand into new territory is through partnership with local rebel groups, who either have control over territory, or some level of freedom of operation that they can share with the terrorist group. This gives the local group a competitive advantage in conducting local attacks that the transregional group can take advantage of if the two cooperate. For example, al Qaeda uses partnerships with Pakistani terrorist groups to provide themselves with access to Pakistani society, which would have been much more expensive to consolidate alone (Fair, 2004). While rebel groups tend to have local aims that are distinct from the transregional group’s, they may be willing to accept sponsorship from a transregional group if it increases their capacity.

An analogy can be drawn between these two classes of non-state actors, and state actors. The Soviet communist party was a transregional actor in many ways. It was interested in fomenting communist revolutions across the world, in part to support sympathetic governments that it could influence. Likewise, the CIA supported, if not democracies, anti-communist groups. These groups can be distinguished from most other domestic parties and actors, which are primarily concerned with local power. Viewed from this lens, al Qaeda has more in common with the Soviet Communist Party than it does with locally focused terrorist groups, in that the structure of its motives lies at the intersection of the global and local.

1.1.2 Why Partner at All?

Transregional and rebel groups can benefit from partnerships because they can gain from efficiencies due to specialization in specific assets. Local groups have access to local infrastructure. By nature of having survived, they have an area of operations within which they
have some level of freedom of operation. This access to territory may mean formal control, or it may mean a network of safe houses. They have local networks that enable them to operate covertly (Parkinson, 2013). They know the language, know who to bribe, can more safely engage with the broader public and raise local funds.

Transregional groups, on the other hand, have global infrastructure. They have access to global donor, arms, and smuggling networks. They have broad, generalizable knowledge and can provide training and intelligence. Global actors have a brand that can sometimes help confer legitimacy, especially among donors and potential supporters (Huff & Strezhnev, n.d.).

Both local and global assets take time and resources to develop. Partnering allows groups with high asset specificity to access assets that would be too hard to develop alone. If partnering is so beneficial, why doesn’t every group do it? What explains the variation?

1.2 LITERATURE: COMMON EXPLANATIONS

1.2.1 IDEOLOGY

One appealing explanation for the variation in sponsorship is that groups form partnerships when they have an ideological or ethnic affinity (Byman, 2013). The intuition is straight forward: groups with similar ideologies are both sympathetic to one another, and have similar goals. The explanation is appealing when viewed from the top down in the case of Islamist rebels such as al Qaeda and ISIS, because supporting Islamist groups in civil wars helps them make direct progress on their goal to establish a Caliphate across the Middle East. Local groups that fit into this broader vision may be happy to play their part if it means help achieving their local ambitions.
Ideology clearly plays a constraining role, but this explanation cannot fully explain variation in three ways. First, ties form between ideologically dissimilar groups: Al Qaeda supported secular groups in Somalia against the US.\(^b\) Al Qaeda provided seed funds to, and ultimately sponsored, Abu Musab al Zarqawi in Iraq despite ideological differences as deep as those between ISIS and al Qaeda today, and a strong personal animosity between Zarqawi and Osama bin Laden (Mendelsohn, 2016).

Second, sponsorship fails to occur when groups are ideologically compatible (Bacon, 2014). Al Qaeda withdrew support from al Shabaab’s predecessor, and declined to officially sponsor al Shabaab, despite bin Laden’s professed ideological similarities, and his personal support for the group.\(^c\) Both Gulbuddin Hekmatyar and Ahmad Shah Massoud were Islamist rebels in Afghanistan, but only one received support from al Qaeda. GSPC was an Islamist group for years before it formed a relationship with al Qaeda and became al Qaeda in the Islamic Maghreb (AQIM).

Finally, group ideology is flexible. Chechen separatist president Maskhadov maintained a careful balance between secular nationalists and Islamism in order to avoid alienating the moderate population while still garnering support from extremists abroad. The rebel groups in Afghanistan regularly changed their narrative in order to justify forming alliances with erstwhile enemies (Christia, 2012). While some level of ideological affiliation may contribute to the variation, it is insufficient to explain why some local groups opt to join a transregional movement, when they do, or when transregional groups will accept them.

\(^b\) Harmony Document: AFGP-2002-600053
\(^c\) Harmony Document: SOCOM-2012-0000005-HT
A larger body of literature addresses tensions between co-ideologues: groups with similar ideologies compete over the same constituents and the same donors, which can make them more competitive than groups with different support bases who are working towards a common goal (Kydd & Walter, 2006; Nemeth, 2013). While the communists were still strong in Afghanistan, the regional mujahidin commanders had common goals and separate constituencies, and therefore could cooperate.

Tensions between ideologues can also exist between local groups and transregional groups, but this tension is likely to be one sided. Transregional groups have global aims which are facilitated by sponsoring sympathetic rebellions. Rebel groups, on the other hand, have local aims, and are more likely to feel threatened by the introduction of a potential competitor in their territory, appealing to their constituents. There was also tension between foreign fighters in Afghanistan, who brought resources, and local fighters who wanted autonomy. However, this feeling of competition is likely to be one sided. Such differences in focus can lead to principal agent problems.

*Ideology Hypothesis: Common ideology is not enough to explain sponsorship decisions.*

### 1.2.2 Power

Ideology alone cannot explain variation in partnerships because it fails to account for power relations, and strategic tradeoffs to partnerships. Rebel groups operate outside the law, so they cannot appeal to a higher authority to enforce agreements. This means that they both have the capacity to harm one another, and exist in a state of anarchy. Moreover, violent groups are often in direct competition either for control of the state, or for leadership of the rebellion.
Competition under anarchy makes it hard for rebel groups to cooperate (Furtado, 2007), but without cooperating, it is also hard for them to survive. Groups balance against threats by forming coalitions (Karmon, 2005), but these coalitions are inherently unstable because when they are strong enough to achieve victory over another coalition, individual factions within the coalition have an incentive to splinter in order to gain concessions (Bapat & Bond, 2012), or form a minimum winning coalition with the other side, thereby maximizing their spoils (Christia, 2012). In the face of local competition, intervention by a third party can help a group to survive when it cannot depend on its local competitors (Bapat & Bond, 2012; Christia, 2012). Like states, transregional groups can help shift the balance of power. For example, AQIM helped Ansar al Dine to overpower other more moderate and nationalist Tuareg groups in Mali.

*Power Hypothesis: Local groups are more likely to seek sponsorship if they are too weak to survive alone.*

1.2.3 **STATE INTERVENTION**

The work on civil war power dynamics described above sheds some light on when local groups might accept sponsorship, but not on when a transregional group that is not in direct competition with local actors would choose to intervene. The literature on state intervention is the closest analogue.

Both states and transregional groups are entities with broad, strategic, geopolitical goals that make decisions about whether to intervene in civil wars. This means that we may be able to learn something about when terrorist group intervention in civil war from insights on when states intervene. States intervene in civil wars for international strategic reasons (Balch-Lindsay &
Enterline, 2000; Kathman, 2011; Tillema, 1989, 1994), domestic reasons (Carment & James, 1995; Saideman, 2002), material reasons (Ross, 2004), or combinations thereof (Regan, 1998). Each of these motivations has an analogue for terrorist groups.

Strategically, transregional terrorist groups have regional or global policy goals that may be furthered by having specific groups in power, or having access to specific regions (Mendelsohn, 2016), which could guide their selection. Al Qaeda’s stated strategy is to focus on the “far enemy,”—the United States. So when the United States intervened in Muslim lands in Iraq, it was crucial to al Qaeda’s strategy to be part of that fight (Mendelsohn, 2016). This helps explain why bin Laden was willing to support someone he personally disagreed with: Zarqawi provided an opportunity to get a foothold in the Iraq war. This means that transregional groups will focus on politically relevant conflicts.

While transnational groups do not have domestic publics, they do have constituencies. These constituencies consist of potential recruits, funding sources, and sympathizers that create a culture that facilitates recruitment, fundraising, and freedom of movement. Another reason al Qaeda needed to get involved in the Iraq war was because it drew such strong international attention. As a new focal point, al Qaeda had to be seen to be doing something in order to maintain leadership over the transnational movement. Constituency concerns will therefore also push groups into politically relevant conflicts.

Materially, transnational terrorist groups may also seek access to resources that may enable them to continue their campaigns, choosing to ally with wealthy groups or with groups that have access to, or may gain access to, mineral wealth. This may explain the initial relationship between AQIM and al Qaeda. Al Qaeda’s brand name conferred legitimacy, while AQIM’s
access to smuggling routes made them flush with funds. An al Qaeda leader cited access to resource wealth as a motive for supporting the Chechen Civil War. Along similar lines, unlike states, transregional groups do not have sovereign territory. One material gain from intervention is territory within which to operate.

1.2.4 AL QAEDA FRANCHISING

There has been some recent work on transregional group sponsorship specifically in the case of al Qaeda. Much of this work has focused on whether or not it is a sign of strength (Braniff & Moghadam, 2011; Farrall, 2011), weakness (Mendelsohn, 2016), or something in between (Byman, 2014).

On the one hand, expansion offered a way for al Qaeda to expand its reach without having to build up grassroots support. Al Qaeda sees itself as a leader in the global jihadist movement, and was willing to support its affiliates in order to achieve its broader goals (Bacon, 2014). Conversely, Mendelsohn contends that it was a strategy born of weakness (Mendelsohn, 2016). The scale of the 9/11 attacks gave al Qaeda the notoriety they craved, but they were unprepared for the fallout. Faced with both increased expectations and decreased operating capacity in the wake of the US response, al Qaeda needed to find some way to double down and show their strength. According to Mendelsohn, affiliation was a strategy that could be used to appear to be in control and expanding, without actually having to pay the costs of doing so. Whether or not al

\[d\] Harmony Document #AFGP-2002-600053. “The internal situation in the Caucasus poses advantages and disadvantages to the jihad movement there. The advantages include: … The region is rich in resources, especially petroleum

\[e\] Harmony Document #AFGP-2002-600053. Another advantage listed was “The nature of this mountainous region and its tough people are totally suited to guerrilla warfare, the inevitable picture of future warfare. In the view of most observers the battle of Grozny was the initiation of this lengthy war.”
Qaeda chose a franchising strategy because they felt insecure, franchising still represents a cheaper way to extend influence than building up an organization in unfamiliar territory. Sponsorship did allow al Qaeda to extend its reach into the territory of the groups it sponsored.

While cooperation can be beneficial, it is also risky. Local affiliates focus on local goals, often at the expense of al Qaeda Core’s mission and reputation (Byman, 2014; Mendelsohn, 2016; Thomas, 2013). Local groups with local goals can also dilute the ideological purity of the parent organization (Mendelsohn, 2016). Maintaining command and control requires time and resources, and risks security (Shapiro, 2008). For affiliates, the al Qaeda name provokes international attention, and local groups must forego autonomy and swear allegiance to al Qaeda in exchange for the brand.

1.3 THEORY

1.3.1 TRANSREGIONAL GROUPS

The above explanations help explain which conflicts groups are likely to be interested in, but do not narrow the scope enough to explain variation, and cannot help explain how transregional groups select among local rebels. If cooperation with local groups provides benefits, why don’t transregional groups ally with everyone pursuing a similar ideological agenda locally, or with everyone who could provide access to territory or other resources? First off, transregional groups have limited resources and cannot invest in all potential partners. For example, under bin Laden, al Qaeda was supportive of, but not prepared to dedicate massive resources toward, al Shabaab. This creates a resource allocation problem, but what are the criteria that drive selection of partners?

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1 Harmony doc. SOCOM-2012-0000005
Given limited resources, transregional groups will invest only in groups that will provide a strong return on investment. When states intervene in civil wars, they are more likely to do so when their investment is necessary and sound (Gent, 2008). Transregional groups follow a similar logic, and only support groups that they believe are strong enough to survive and to provide secure access to territory. Providing training and resources to a group that will soon be dismantled results in a wasted investment, but is also dangerous because it allows counter-terrorists to use information captured from the weak group to target the transregional group.

*Investment hypothesis: Transregional groups want strong local partners.*

Being a good investment means being able to survive, but it also means that the investment will translate into the outcomes that interest the transregional group. These outcomes may be overthrowing a government, maintaining access to a territory, or even maintaining a trade route as in the case of organizations involved in the black market. The ability of a local group to deliver depends both on their capacity to deliver outcomes, and their interest in delivering outcomes favorable to the transregional group.

Strong group have a greater capacity to deliver because they have better command and control over their rank and file. Better command and control means more efficient and directed use of the resources provided to the group. Transregional groups can provide training with international contextualization. Groups with a strong command and control structure, whatever that structure may be, will be better able to utilize the lessons and training provided by transregional groups. Without command and control, lessons provided by the transregional group cannot diffuse to operatives. Without disciplined and skilled operatives, coordination of attacks is difficult.
Similarly, since groups with stronger command and control can better control their own actions, they are also better able to commit to actions that are in the interest of the transregional group.

One of a transregional groups most valuable assets is its international network of operatives and donors. This means that it must carefully maintain its reputation. Transregional groups prefer partners with strong command and control in part because they are better at controlling their low-level operatives, and can therefore better guard their reputation. For example, al Qaeda in the Islamic Maghreb (AQIM) commanders complained of the lack of discipline among their affiliates in Mali, and how it alienated local populations and foiled their plans to create a long-term base of operations. Enforcing command and control of local affiliates, when it is possible at all, is risky and expensive (Shapiro, 2008).

Finally, the investment is favorable if the local group can commit to engaging in activities that are beneficial to the transregional group. Local groups and transregional groups have inherently different interests. Local groups focus on local goals, often at the expense of the transregional group's mission and reputation (Byman, 2014; Thomas, 2013). One reason for the tensions between al Qaeda-core and ISIS' predecessor al Qaeda in Iraq (AQI) was that the brutality and sectarianism of AQI harmed al Qaeda-core's international reputation. Conversely, transregional groups focus on transregional goals at the expense of local goals. Haqqani was frustrated when bin Laden redirected his forces from what Haqqani considered an important local battlefront, to defend Saudi Arabia from Sadam Hussein, which bin Laden considered a more important international battlefront.

While at the most basic level transregional groups want access, their very presence impinges on the sovereignty of their local partners. The Taliban did everything they could to prevent bin
Laden from making public international statements because they believed it harmed their efforts to gain international recognition as the government of Afghanistan, even though the statements contributed to al Qaeda's primary objective. Groups will partner when their interests are more aligned. Note that this is not the same as having a common ideology: al Qaeda supported secular groups against the US in Sudan, for example.

There is an inherent tension in the value of affiliate strength. In asymmetric interstate alliances, the weaker state can compensate the stronger state for failing to contribute much defensive capacity to the union by giving up some of their autonomy (Morrow, 1986, 1991). A similar dynamic may take place among militant groups (Bapat & Bond, 2012). Strong groups are more able to exert their independence. Because they are less dependent on the transregional group, they will be less willing to alter their behavior to accommodate the transregional group’s objectives. But weak groups are a poor investment: it is only worth investing in a group if that group can survive.

While the nature of the relationship may change depending on group strength, the importance of reputation and survival to transregional groups means that they will err on the side of choosing strong groups. While states have the luxury of having weak allies because they have territory, transregional groups depend on their affiliates for access to land. Moreover, weak groups have poor command and control. While some of the divergent interests between al Qaeda and its affiliates are strategic, many of the most damaging divergences related to reputational damage when local groups were brutal or behaved criminally. Less professional groups with worse command and control are more likely to engage in criminal activity, and thus damage the reputation of the transregional group—as occurred with Ansar al Dine and AQIM in Mali. It is
better to lose some influence over a partner than to lose access to territory because a group is weak, or to compromise an international brand by affiliating with groups incapable of preventing local units from engaging in undirected criminal behavior. From Somalia, to Algeria, to Afghanistan, al Qaeda has shown a preference for affiliating with strong groups.

_Hypothesis 1: Transregional groups prefer **strong** local partners that provide a safe investment over weaker local partners that they can control._

### 1.3.2 Local Groups

Local groups benefit from cooperation because they receive resources, training, global intelligence, and access to international networks providing funds, legitimacy, and recruits. Sponsorship from a transregional group can tip the power balance in the local conflict and help a group to survive or succeed in consolidating control over their territory. For example, with support from AQIM, Ansar al Dine was able to make major territorial gains in Mali.

The benefits of being sponsored also come with costs. Local groups trying to consolidate territory care about local sovereignty, and must give up some level of sovereignty and autonomy when they allow a transregional group freedom of action within their territory. Al Qaeda requires all of its official affiliates to swear bayat, or a formal declaration of obedience to al Qaeda-core’s leader. This requirement for subservience was almost enough to make Zarqawi of al Qaeda in Iraq refuse affiliation (Weaver, 2006). Even more extreme, once a transregional group is present, it may compete for influence locally. This kind of competition is in part why ISIS split with al Qaeda when it entered the Syrian Civil War. Along similar lines, local groups must also trust that if they grant transregional groups access, they will continue to support them, and not their rivals.
While al Qaeda may have benefited from access to the Northeastern regions of Afghanistan, supporting Massoud’s Jamiat-e-Islami would have meant supporting their chosen sponsoree’s enemy. Hekmatyar, the leader of Hezb-e-Islami, was angry when he erroneously believed that al Qaeda had provided weapons to Massoud.\(^g\)

Beyond power relations, local and transregional groups also have inherently different goals. Transregional groups want local groups to engage in activities that benefit their broader goals at the expense of local objectives. Local groups are interested in winning a local conflict, while transregional groups have broader goals that extend beyond the local context. For example, bin Laden, partnered with the Haqqani network in Afghanistan, withdrew his forces at the last minute from a joint attack on the Khost airport, in order to prepare his soldiers to protect Saudi Arabia from an expansionist Saddam Hussein just before the first Gulf War.\(^h\) While both al Qaeda and the Taliban benefited from the Taliban’s control of Afghanistan, al Qaeda launched the 9/11 attacks without the knowledge of the Taliban, which stood to suffer.

Local groups should only be willing to trade autonomy for the benefits sponsorship can provide when they have to. They only have to when the transregional group can offer something necessary to their survival. But, only groups that are strong enough to survive are a safe enough investment for transregional groups. So when does partnership occur?

**Hypothesis 2:** Local groups only accept transregional support when they require something that the transregional actor can provide, which they cannot attain on their own.

Groups use substitutable goods in order to survive and act. They need resources for arms and training, recruits, and territory within which to act. Resources, recruits, and training can come

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\(^g\) Harmony Document: AFGP-2002-800581
\(^h\) Harmony Document: AFGP-2002-600090
from substitutable sources. Recruits can be drawn internationally, or from different local constituencies, and different groups are better suited to tapping into different recruitment pools. Similarly, resources can be drawn from the population, trade, natural resources, looting, or international donors. Training and military expertise can be sourced locally, from state sponsors, or from transregional group sponsors. Groups will only accept the hit to their autonomy by accepting sponsorship if they have no other way to access the goods they need to survive or succeed. This helps to resolve the apparent contradiction: local groups can be capable of providing strong command and control, and be established enough to survive, but be unable to, or less efficient at, producing an asset necessary to thrive. This is especially likely when groups are in decline, or face a new foe.

Local groups and transregional groups specialize in different tasks, and are therefore better at producing different assets necessary for producing sustained local rebellion.\(^1\) Transregional groups, by their nature, are better at soliciting international donations and recruits.\(^2\) Their connection to the international network also allows them to source weapons and other supplies. They can also provide generalizable expertise. Al Qaeda-core specializes in collecting lessons learned from their affiliates in order to produce contextualized best practices for the conduct of fighting, which they package into training that they offer to their operatives. This makes al Qaeda fighters very effective in a general sense.

Local groups, on the other hand, have access to territory. Even if they do not hold sovereign control over territory, they have an area within which they are able to operate. For example, they may have bribed the appropriate officials, or have a network of safe houses allowing them to

\(^1\) AFGP-2002-800597
operate within a territory controlled by the government. Transregional groups would have to duplicate this effort without a detailed knowledge of the local context. Local groups also specialize in cultivating the support of their local base, which can provide funds or facilitate their operations within their territory.

Transregional groups can invest in operating locally, and local groups can invest in building transregional networks, but this requires a concerted effort that distracts from their primary goals. The Haqqani network, a local group in Afghanistan, was unique in its efforts to create its own global support network that allowed it to continue to operate somewhat independently of the larger regional warlords (Peters, 2012b). It was able to do this by publicizing its exploits in magazines. This attention to international donors was part of what attracted support from bin Laden to begin with, with the burgeoning al Qaeda being an important part of his network. Similarly, Sayyaf of Ittehad-al-Islami was able to build a group because he solicited support from Arab donors. This allowed him to substitute international recruits and funds for a local support base, and thus to be a successful local commander in the Afghan Civil War. Haqqani and Sayyaf were exceptions. Others, such as Younis Khalis, tried, but were unable to gain international support because of their lack of notoriety.

This specialization allows groups to cooperate to more efficiently produce their goals. Transregional groups depend on local groups for territorial access. Local groups will accept transregional group support when they can provide a good that they specialize in, and the local group requires access to in order to succeed. This allows a possible resolution in the tensions between hypotheses 1 and 2. Transregional groups want strong partners, but strong, self-sufficient local groups prefer independence. Because groups have limited resources, partnership
between strong local groups and transnational groups is possible when the transnational group can provide specialized goods needed by the local group.

*Hypothesis 3: Cooperation between strong local groups and transregional groups is possible when transregional groups can provide specialized goods required by local groups.*

1.4 **Case Studies**

1.4.1 **Case Selection**

To test the theory, I use four case studies in which I examine the effect of the trajectory of group strength on sponsorship. The theory presupposes that the groups have shared aims and would benefit from cooperation. I therefore condition on ideological affinity, and transregional group interest in the conflict. Al Qaeda’s global legitimacy and access to donor networks and recruits hinged on their involvement in global jihadist struggles against non-Muslim occupiers, and support for groups establishing Islamist emirates. This makes several civil conflicts stand out as likely candidates for intervention. Specifically, al Qaeda was interested in the Afghan and Chechen civil wars against Russia. In Algeria, they had an interest in supporting Islamists against the French backed regime and pro-French elite. In Somalia, al Qaeda was interested in opposing the United States and the UN Operation in Somalia, as well as in taking advantage of ungoverned territory there.

These four cases, Afghanistan, Chechnya, Somalia, and Sudan, provide variation within which to test the theory. Three cases show within-case or temporal variation, helps to control for many possible confounders. The final case, in which no partnership occurred, helps ensure that the three previous cases were not just a matter of arbitrary timing. First, AQIM exhibits temporal
variation: why did AQIM’s predecessor, the Salafist Group for Preaching and Combat (GSPC), opt for sponsorship at the time at which it did, given it, and its predecessor the Armed Islamic Group’s (GIA), long term ideological affinity? My second case, Afghanistan, exhibits within-case variation: Osama bin Laden had to choose between two Islamist warlords with whom he shared some ideological affinity. Why did he choose Hekmatyar over Massoud, despite his early ties with the Muslim Brotherhood? Somalia shows temporal variation: why did al Qaeda give up on Somalia, and why did they eventually change their mind to support al Shabaab? Finally, why was there no partnership between al Qaeda and rebels in Chechnya, despite their ideological affinity, the importance of the Chechen civil conflict to al Qaeda’s rhetoric, and al Qaeda’s demonstrated interest?

1.4.2 EMPIRICAL IMPLICATIONS OF THE THEORETICAL MODEL

If the tensions described the theory are at play, we should expect to see several things in the case studies. First, transregional groups should avoid entangling partnership with, or abandon, weak local groups that cannot provide security or command and control over their sub-units. If transregional groups prefer highly asymmetric partnerships in which they create new groups, sponsor weak groups that are beholden to them, or avoid sponsorship of strong groups that are independent, then that would be evidence in support of the alternative hypothesis that transregional groups prefer sponsees that they can control.

Second, strong self-sufficient local groups should reject sponsorship by transregional groups. Groups should only give up their independence when they have exhausted alternative means of survival. Evidence against the theory would be if local groups accept transregional group
presence when they were self-sufficient. This might suggest that local groups are looking for support wherever they can find it, or that they are driven by ideological considerations.

### 1.4.3 Algeria

The Algerian civil war began in 1992, when a military coup attacked the Islamic Salvation Front (FIS) party\(^k\) after a first round of electoral victories, before their anticipated victory in a second round.\(^1\) The military pushed out the defeated prime minister,\(^m\) canceled elections, rounded up thousands of FIS supporters and worked to dismantle the organization. The military successfully captured most of the FIS leadership and many supporters, successfully clamping down on public uprising for a time. Surviving members of the FIS fled, creating the more moderate Armed Islamic Movement (MIA) under Abdelkader Chebouti, and the more radical GIA under Abdelhak Layada. While the groups sometimes coordinated action, the MIA and FIS focused on military targets and were open to dialogue. The GIA, on the other hand, was more violent and targeted both civilians and the military.

The origins of the GIA and their initial ties to al Qaeda are unclear. Some secondary sources suggest that early GIA members were veterans of the war in Afghanistan where they came into

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\(^k\) “Algeria's Islamic fundamentalists, poised for election victory, said yesterday the armed forces had been deployed in strength throughout the country over the last 24 hours … [to] regions where seats were decided at the first poll.” (Reuter, 1992)

“Security forces last night arrested Mr Abdel Kader Hachani, the acting leader of the FIS for inciting soldiers to desert the army.” (Financial Times, 1992).

FIS leaders arrested, supporters take to the streets. (Financial Times, 1992)

\(^1\) “Resounding victory of the Islamic Salvation Front (FIS) in the first round of the country's general election.” (Financial Times, 1991)

“While this second round is not expected to prevent the fundamentalist group, the Islamic Salvation Front, from winning a majority, the hope of the secular forces is that they can win enough seats to give them a voice in the new assembly” (Daily News of Los Angeles, 1991)

\(^m\) Anti-Democratic Forces Push Chaldi Out. (Neary & Hollick, 1992)
contact with al Qaeda (Tawil, 2011). Another report suggests that bin Laden offered funding if GIA promised to split with the MIA, and then rescinded support when the GIA requested exclusive funding in Algeria. If this report is true, it suggests that the GIA opposed bin Laden funding its competitors, and viewed the funding as a means to get a comparative advantage in the conflict. It is also possible that they attended training at bin Laden’s camp in Khartum during his time in Sudan. None of these reports are verified. Either way, if there was a relationship early in the group’s existence, it did not amount to full scale sponsorship. Al Qaeda did probe other neighboring Islamist groups while headquartered in Khartum, it may be that he briefly engaged with the GIA. If it existed at all, it was likely little more than either a personal relationship between members of GIA and al Qaeda formed during the Afghan civil war, or a small seed investment from bin Laden.

The GIA was unlikely to rely on al Qaeda for external fundraising, because the GIA sent operatives to France to engage in fundraising and recruiting directly. They also drew revenue from local taxation and check points, looting, and kidnapping ransoms, which was enough to support their efforts through the early 90s.

The GIA’s undoing was their exceptional brutality (Tawil, 2011). It enforced its draconian version of Shariah law and targeted anyone it condemned as an apostate, which included anyone who was not a supporter. They conducted massacres and executed or mutilated civilians for offenses such as having a satellite dish, or not wearing a scarf. They also targeted defectors and

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^ A footnote in a Combating Terrorism Center suggests that report refers to “Muqaddam, 80ff”, “Muhammad Muqaddam, al-Afghan al-Jaza’iri: min al-jama’a ila’l-qa’ida (Rouiba: Mu’assasa al-wataniyya li’l-itsal wa’l-nashr wa’l-ishhar, 2002).” I cannot find this reference. It is possible that it is an unreleased document in the Harmony center, or an Arabic language document.

^ A footnote in (Brynjar & AAshild, 2001) refers to an msnbc article with a broken link and that I could not find in news archives in which unnamed US officials claimed there was a connection to Khartom

^ See an account of the massacres by an independent truth commission (Mellah & justice pour l’Algérie, 2004)
members of rival groups. As a result, they rapidly lost public support, domestically and internationally,⁹ which harmed their ability to partner with others. Moreover, it was rumored that GIA had been infiltrated by the Algerian security forces, which meant that other resistance groups were hesitant to cooperate lest they be targeted by the Algerian government, and internal commanders lacked trust. The GIA, with its failing reputation, was not a viable candidate for sponsorship.

In 1996, rifts began to form between commanders in the GIA over the failure of their civilian victimization strategy. In 1998, Hattabi led an exodus of commanders into the newly formed Salafist Group for Preaching and Combat (GSPC) over conflicts about the targeting of civilians. Hattabi publicly declared his opposition to the killing of civilians. The public break amounted to rebranding for the commanders who made the move. The GSPC could portray itself as more civilian friendly, and capitalize on the swell of support to outpace the remaining commanders in the GIA, while maintaining some operational continuity and access to funding networks.

The GSPC’s initial success was short lived. After the September 11th attacks, the U.S. clamped down on global terrorist financing, freezing GSPC assets.⁷ This constrained GSPC’s capacity to draw on funds from Europe. For example, the GSPC had skimmed from disreputable Muslim charities, many of which were shut down. Assets were also seized. Several million U.S. dollars in ransom funds were frozen in Chad. In 2003, the war in Iraq diverted funds and potential recruits. These financial pressures contributed to the conduct of criminal activity and the weakening of the GSPC’s anti–civilian casualty reputation.

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⁹ The GIA was condemned by the Libyan Islamic Fighting Group, Egyptian Islamic Jihad, Osama bin Laden, and former supporters including Abu Qatada and Abu Musab-al-Suri. (Mendelsohn, 2016)
⁷ (Executive Order 13224, 2001)
Meanwhile, the government made inroads toward finding a resolution to the conflict. Algeria held presidential elections in 1995, and parliamentary elections in 1997. In 1995 the FIS and other small groups entered into talks with the Government, though these talks were unsuccessful. In 2000, the government began signing amnesty agreements to encourage rebels to lay down their arms. With the possibility of government reconciliation, and concerns over civilian casualties, Hattab pushed to negotiate with the government.\(^8\) This caused fissures within the GSPC between Hattab and more extremist commanders. In September of 2003, Hattab resigned as leader of the GSPC. Many of the rank and file also began to leave in favor of accepting amnesty deals (Tawil, 2011), though this was buttressed by the release of over a thousand imprisoned combatants, many of whom rejoined the rebellion.\(^1\)

Facing financial straits and with dwindling popularity and recruitment, the GSPC needed access to new resources and to find a new way to legitimize themselves and seek access to recruits and funds.\(^9\) In 2004, they began to make inroads to al Qaeda-core,\(^v\) because al Qaeda could provide them with a different pool of recruits and a different source of legitimacy. These inroads began with a unilateral declaration of support for al Qaeda in order under the new emir, Nabil Sahraoui. After Sahraoui was killed, his successor Abd al-Malik Droukdel continued to solicit support from al Qaeda, using Zarqawi in Iraq as a mediator. In 2006, GSPC formally

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\(^8\) Portion of an interview with Hattab, published in (Tawil, 2011)
\(^1\) Interview with Droukdar, leader of GSPC from 2006 onwards. (The New York Times, 2008)
\(^9\) “We saw the merger with al-Qa’ida as giving us the breathing space we badly needed,” Quote from AbuUmar Abd al Birr, head of GSPC media wing, published in (Tawil, 2011)
\(^v\) Ibid.
declared bayat to al Qaeda, and changed their name to Al Qaeda in the Islamic Maghareb (AQIM). By 2008 at the latest, a Qaeda-core was funneling funds to AQIM. 

The leadership of the group, which remained largely constant from their time in the GIA, initially focused on the Algerian conflict. When their local tactics hurt their credibility and capacity, several major leaders rebranded as the GSPC. It was only when the global war on terror reduced their fundraising capacity and local reconciliation efforts reduced their local standing that they reached out formally to al Qaeda for support. Rather than focusing on national liberation, the group shifted focus toward creating a caliphate because it allowed them to draw from a new pool of recruits, and on a new source of legitimacy. The group’s first choice was to attempt to rebrand, but when that didn’t work, they sought sponsorship from a transregional group, and shifted their behavior in order to continue to effectively gain that support, and in order to rely on al Qaeda’s more robust financing networks.

1.4.4 AFGHANISTAN

Variation among the commanders in Afghanistan is more complex. The two major Islamist commanders, Ahmad Shah Massoud and Gulbudin Hekmatyar, both sought support from donors operating out of Peshawar. All parties required support in order to survive for two reasons. First, the war was highly asymmetric: groups needed access to funds and weapons in order to survive against the Soviets. Second, there was considerable competition among the rebels. Groups were made up of nested commanders, each vying for independence and prominence. Success in this

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w Abbatobad document titled “Respected Brother, kind Shaykh, Zamrai, Sahib”. In it, an al Qaeda operative uses coded language to inform bin Laden (Zamrai) that funds had been transferred to the “Algerians”. Two of the names referenced in the letter refer to individuals who either died or were killed in 2008.
competition required having access to funds and weapons which could be funneled to sub-commanders to secure their support as they engaged in their own local competitions. All parties needed external support because everyone else had it, and if they didn’t, they would be replaced by an enterprising competitor who was willing to accept outside funds from one of the many states or non-state actors who wanted to influence the war.

Two cases exemplify the importance of external support in Afghanistan, and the extent to which it was able to help commanders become primary actors in the war. The first is the success of Sayyaf and his Ittihad-al-Islami. Sayyaf had little support or influence within Afghanistan, but was able to recruit foreign fighters in order to become a lasting, prominent actor within the civil war. He was kept relevant and afloat because of both state and non-state support. Ismael Khan in Herat was defeated, but was able to start afresh and reenter the war after being funded by Iran. In both of these cases, it was access to funds and weapons provided by external actors that allowed these groups to not only survive, but to thrive.

Both Hekmatyar and Massoud required external support to survive, but Hekmatyar was in greater need for several reasons. First, Massoud was a more charismatic, popular figure. He had a broader base of popular support. To this day, his commanders and advisors use their connection to him as a source of legitimacy. He was also good at talking to Western media, which earned him friends in Washington, where he was viewed as the least distasteful option. Most US support went to Hekmatyar indirectly through Pakistan, but the US did provide Massoud some funds directly. The US was an ideal supporter because it was legally not allowed to get involved directly in the civil war, and was thus very hands off. US support consisted of checks and weapons with few real strings attached. Once, when the US paid Massoud to attack
the Soviets in a mountain pass, he took the money but made no attack. He was not punished, and continued to receive funds, because the other options were so unsavory.

Hekmatyar was more conservative and more brutal, which made him unpopular in Washington. He received much of his support through Pakistan, which wanted an Islamist who would not challenge the Durand line dividing Pashtunistan between Afghanistan and Pakistan, to dominate the Pashtuns. Hekmatyar ruled because he was able to funnel funds to his sub-commanders, and because he had the biggest stick. Under him were several relatively independent commanders, with less of a base of popular support. His coalition was therefore less stable, and he was more dependent on external support for funds. Hekmatyar and Massoud were among the two strongest parties vying for dominance in the rebellion, and as such, had an interest in both gaining external sponsors, and preventing one another from receiving support. Unlike Massoud, who had more options because of his cultivated relations with the West and his base of popular support, Hekmatyar was active in Peshawar soliciting donations and competing against, (and assassinating,) his rivals.

One source of support was the Arabs who had congregated in Peshawar in order to support the jihad against the Soviets. The precursor to al Qaeda, the Services Office, was founded by Abdullah Azzam and his young mentee, Osama bin Laden. The Services Office was transregional in nature—Azzam had helped seed the Muslim Brotherhood in Palestine—but was less militant than al Qaeda would be. It was intended to help rid Muslim countries of foreign occupiers, but bin Laden was still a Saudi patriot, and the organization was not focused on overthrowing corrupt leaders. While it funded the rebels in Afghanistan, it had no regular

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*While his support was funneled through Pakistan, the original source of the support was Pakistan, the US, and Arab donors.*
fighters and focused on humanitarian work. Azzam, who shared brotherhood ties with Massoud’s party, favored Massoud as his warlord of choice.

Aymin al Zawahiri fled Egypt to Afghanistan after failing to foment jihad. He believed that Egypt should be the seat of global jihad, and that Afghanistan was a peripheral conflict but an opportune place to train forces for the real battle in the Middle East. A medical doctor, Zawahiri worked in a field hospital on the border in order to gain experience and credibility, and recruit support for jihad in Egypt. He met bin Laden, and the two became secret friends because Azzam disapproved of the relationship and the bad influence he was having on bin Laden.

Al Qaeda’s eventual support for Hekmatyar over Massoud can in part be explained in terms of petty politics among the Arabs in Peshawar. Bin Laden, who was young, rich, and idealistic, was a catch for anyone trying to create a militant group. As the competition for bin Laden’s favor intensified, Hekmatyar and Massoud were drawn in. Azzam favored Massoud, Zawahiri favored Hekmatyar. Rumors about Massoud spread through the camp, such as that Massoud was bathing with French nurses, in an attempt to discredit Massoud, which in turn discredited Azzam.

Internal politicking alone is not enough to explain why the conflict unfolded as it did, however. Azzam was a popular charismatic figure who had disagreements with Zawahiri’s vision for the future, so conflict was inevitable, but why did support for Hekmatyar and Massoud fall the way they did, and why did the conflict center on who to support?

Unlike Azzam’s more charity-oriented approach, Zawahiri’s vision required the formation of a transregional militant organization, with fighters that required access to the battle, and territory within which to operate autonomously. Massoud was a poor choice for two reasons. First, his territory was far away from the border. Getting to the Panjshir valley required a two week
donkey ride across the Hindu Kush mountain range. Second, Massoud was not as keen on allowing fighters to operate within his territory. He had more consolidated, centralized control with a stronger domestic support base than did Hekmatyar, and had access to hands-off Western funds. Unlike Massoud, Hekmatyar spent time in Peshawar lobbying for support, and was willing to allow bin Laden and his fighters to act within his territory.

The decentralized structure of Hekmatyar’s organization also made him an appealing choice. Bin Laden’s first base was within the territory of one of Hekmatyar’s sub-commanders, Jalaludin Haqqani. In pursuit of autonomy and security, Haqqani solicited external support from the Arabs. He was the one willing to give territory to bin Laden for his first training camp in exchange for access to fighters and infrastructure. Bin Laden and Haqqani built a complex of caves, and bin Laden built a training camp near one of Haqqani’s (Fisk, 1993). New recruits would receive basic training with Haqqani before moving on to bin Laden’s camp after which they would choose whose units to join (Rassler & Brown, 2011). Though Hekmatyar would later rent land to bin Laden for additional bases.

The fledgling al Qaeda partnered with Hekmatyar because he was one of the strongest Islamists in the country, and because he, and more importantly his sub-commander Haqqani, were willing to trade territory for access to the Saudi network of donors and fighters that al Qaeda could provide. Haqqani was willing to give up sovereignty some sovereignty because it secured his position in the competition for prominence among local warlords, and Hekmatyar was willing to consent for similar reasons.

Later, once the Taliban had gained control and grew in strength, there were tensions between the Taliban and bin Laden. The Taliban didn’t need al Qaeda, and did not want to accept the
decrease in sovereignty that allowing al Qaeda access to Afghanistan entailed. The Taliban publically tried to distance itself in order to avoid the negative repercussions of affiliation with al Qaeda (Shenon, 1999). In response to finding that Bin Laden had acted against his wishes within his territory again, Mullah Omar exclaimed: “There is only one ruler. Is it me or Osama?” Mullah Omar wanted Western recognition, which was harmed by bin Laden’s continued media presence. The Taliban did its best to keep bin Laden off air (Cullinson & Higgins, 2002), but al Qaeda was operating from within Haqqani territory. Haqqani maintained relative independence under Younis Khalis, who had officially declared fealty to the Taliban, but who operated independently enough to be able to provide secure territory to al Qaeda.

Al Qaeda was even wary of supporting the Taliban at first because bin Laden did not believe that they had a strong organization that could successfully control territory. The Arab fighters viewed the Taliban as country bumpkins, incapable of sophisticated ideology or ruling the country (Cullinson & Higgins, 2002). Haqqani’s erstwhile commander, Younis Khalis, promised bin Laden that he would do what he could to intercede with the Taliban should bin Laden ever get into trouble. Moreover, bin Laden forbade any of his fighters from fighting with the Taliban. The only time this rule was broken was when they were conducting joint activities with Haqqani (Peters, 2012b; Rassler & Brown, 2011). Al Qaeda remained predominantly within Haqqani’s territory. The other commanders were falling to the Taliban, meaning that they could not have offered al Qaeda sustained territorial access. Haqqani managed to maintain his independence while officially joining the Taliban, so his territory was relatively safe. The Taliban might have been able to offer more expansive territory, but they were still untested when bin Laden returned...
to Afghanistan. It wasn’t until the Taliban became strong that bin Laden attempted to reconcile with Mullah Omar.

While Haqqani was technically Taliban affiliated when al Qaeda returned to Afghanistan, Mullah Omar was not acceptant of their presence until after the US cruise missile bombing, at which point reconciliation with the West became less of a priority. Viewed through the lens of the theory, it was not until the Taliban realized that they could not receive legitimacy from the West that they turned to another source. By recognizing Mullah Omar as an Emir, bin Laden provided the Taliban with much needed legitimacy, and in exchange, received access to Taliban territory and a position of trust with Mullah Omar.

Other groups did want al Qaeda affiliation. A letter to bin Laden from an unnamed high ranking al Qaeda official describes the influx of affiliate requests in 2010, and the need to develop a system to handle them and to exclude groups that would not be good stewards of the brand name. The reason cited for this influx is the growing popular appeal of al Qaeda, and the desire for legitimacy. As al Qaeda specialized in creating a network of support, groups sought sponsorship in order to solicit funds and recruits from new constituencies.

While GSPC and the Afghan commanders had strong organizations, al Qaeda has refused partnership with organizations that were not capable of effective command and control, even if they offered territorial access. While al Qaeda has built training camps in several countries, they do so in areas securely controlled by a sponsored group.

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3 Harmony Document: SOCOM-2012-0000006
1.4.5 CHECHNYA AND THE CAUCASUS

While sponsorship decisions in the other three cases were two-way, they were often driven by solicitation from local groups. The Chechen case is valuable because it highlights an example of a strong group refusing attempted inroads by a transregional group. My first order is to demonstrate that al Qaeda wanted to be involved in the Caucasus.

The Chechen conflict has long been rhetorically important to al Qaeda. Russian control of, and humanitarian abuses in, Muslim-majority Caucasus is a frequent refrain in calls to Jihad. Moreover, early in al Qaeda’s career, Chechnya was one a popular wars in extremist circles. Involvement would have helped al Qaeda to recruit, fundraise and expand their global network. For example, Mounir El Motassadeq, one of the plotters for the 9/11 attacks, testified that Atta, the mastermind behind the attack, and wanted to fight in Chechnya.

There is also a fair amount of evidence that al Qaeda tried to do more than pay lip service. Because the nature of their operations are covert, establishing exactly how they were involved is challenging. While any single piece of evidence is circumstantial, when taken as a whole, suggest fair confidence that al Qaeda would have liked to expand into the Caucasus region. In 1996, as the Afghan civil war was beginning to draw down as the Taliban took control, al Qaeda began to explore next steps. Bin Laden had already moved to Khartoum to probe the situation in Africa as a potential next locus. Aymin al-Zawahiri allegedly went to Chechnya to explore the possibility of engagement there, but was captured by Russian forces and imprisoned for 6 months. According to an al Qaeda defector, bin Laden paid recruits $1,500 to go to Chechnya to cover the cost of weapons.
Bin Laden and the early members of al Qaeda-core likely had personal relationships with some of the commanders in the Chechen civil war dating back to when they were all followers of Azzam in Afghanistan. Specifically, Ibn al-Khattab and his successor Abu Walid, commanders of the foreign fighters unit in Chechnya, started their career as jihadists in Afghanistan. These personal relationships should not be overstated—both Khattab and Abu Walid fought in both Chechen civil wars, earning their fame and position, married local wives, and made the Chechen conflict their own. But their movement to Chechnya suggests that Chechnya was a priority for Azzam’s mentees. It is possible that bin Laden sent a small core of al Qaeda forces to join Khattab in Chechnya. Reports of al Qaeda fighters are unconfirmed and are likely to be exaggerated by the Russian media. However, al Qaeda affiliates were found in sweeps of the Pankisi valley, a rebel safe haven in Georgia, in 2002. If al Qaeda did send fighters, it may have been to explore the possibility of getting a foothold for involvement in the conflict.

Finally, Chechen fighters participated in the Afghan civil war, and some likely attended training camps there before returning to Chechnya. Al Qaeda training camps are selective, that they took in Chechen fighters may suggest an attempt to create sympathy toward al Qaeda’s ideology among fighters. Together, the collection of evidence suggests an al Qaeda interest.

The Chechen separatists were resistant to interference from foreign influence. This was in part due to the nationalist undertones to the rebellion, and in part because groups were able to sustain themselves without loss of autonomy. The first civil war began in September of 1991 when Chechnya unilaterally declared independence. The rebellion was initially united under President/General Dzhokhar Dudayev. Players that would later emerge as major commanders remained subordinate under Dudeyev’s charismatic leadership. Dudeyev kept the conflict local.
For example, when Major (at the time) Baseyev requested permission to take his Special Missions Battalion to participate in the conflict in the Abkhaz, Dudayev refused. Baseyev resigned and took “volunteers” instead, which allowed Dudeyev to credibly deny that official Chechen units had been sent. But the outflow of Chechen fighters to the conflicts in Afghanistan and Abkhazia in anticipation of the war with Russia created valuable expertise that would benefit the rebels during the war.

The rebellion remained strong, unified, and independent through the first Chechen civil war. War broke in 1994, with the forces under Dudayev opposing a pro-government militia under Umar Avturkhano and Russian forces. Throughout 1994, the rebels maintained a strong position, inflicting losses on the Russians. In 1995 the Russians began to push south into rebel strongholds, but rebels were able to retreat into the hills. Besayev retaliated by taking a hospital with 1500 hostages in Budennovsk, which led to immediate concessions including a ceasefire with safe passage and peace talks.

Like in Algeria, with peace on the horizon, internal fractures started to appear. Baseyev was only willing to accept complete independence, while Dudeyev was willing to accept autonomy under Russian control. By 1996, Baseyev remained loyal to Dudeyev but controlled roughly a third of the separatist fighters. Still other factions wanted Dudeyev to be more tolerant of criminal activity in order to fund their operations, especially as Dudeyev’s resources started to run thin. In May of 1996, Dudayev was assassinated and briefly succeeded by his vice president, before Russian withdrawal and the end of the war. With Dudeyev gone and imminent elections for control of the new separatist government, called the Government of Ichkeria.
Aslan Maskhadov won the election, beating Shamil Baseyev. Baseyev was appointed prime minister, several units were incorporated into the government’s regular forces, and others were told to disband. Some militias, including that of Salman Raduyev, refused to disband or be formally integrated. Commanders such as Raduyev used their militias for criminal purposes and personal enrichment.

Tensions came to a head in 1998. Violent clashes took place between nationalists and religious radicals. Tensions between Maskhadov and Raduyev tipped into open opposition when Raduyev tried to take the city of Gudermes as a personal fiefdom in a break with the rest of the separatists, and when Raduyev conducted a deadly train blast in Armavir, Russia. There was an assassination attempt against Maskhadov.

Maskhadov tried to use his response to the assassination attempt to solidify control. He blamed the assassination and clashes on foreign fighters, expelled five foreign nationals, and demanded that the Wahabi radical groups disband immediately, including the paramilitary units that had participated in the attacks on Gudermes. He stripped Arbi Barayev, Ramzan Akhmatov, and Abdul Malik Mejidov, three religious commanders, of their ranks. He further integrated another 500 fighters into the regular units and mobilized 5000 reservists, to crack down on black market trade, kidnapping, and other criminal activity.

Maskhadov’s efforts had a mixed effect, but ultimately did not stop the fractures. The Wahabist groups immediately released a statement in support of Maskhadov and the Chechen people, promising to only conduct terrorist attacks against Russia and not within Chechnya. But they immediately reformed into a new council called the Jamaat. Bareyev formally resigned as
prime minister, but Maskhadov was able to coopt him as Deputy Chief Commander of the Armed Services in order to maintain some unity.

While Maskhadov tried to take control in Chechnya, Khattab and Basayev made inroads into neighboring Dagestan. Together they formed the Islamic International Brigades (IIB). Partnering with Basayev gave Khattab some local legitimacy in light of the crackdown by Maskhadov. This also marked a religious turn for Basayev, who was always more conservative than Maskhadov, but who was now embracing Wahabism. The incursion ultimately failed, in part because of a lack of broad-based support for Wahabism, and in part because of the ethnic heterogeneity of Dagestan.

By 2000, war had resumed. After their previous successes, the rebels expected to be able to hold off the Russians again, but the Russian force was stronger and somewhat more professional than in the previous war. They were also at least as brutal, which led to war weariness and difficulties recruiting. While the separatists were hard pressed, they were able to maintain their cohesion by successfully transferring to Guerilla tactics. Russia controlled the cities, while the separatists controlled the periphery and foothills, and the separatists were able to avoid deep seeking external intervention.

By 2002, tensions began to arise between Basayev and Khattab because Khattab was unwilling to share the resources he received from his personal fundraising network in the gulf. Khattab was able to maintain operational independence by failing to specialize and drawing on his own international network, in a similar way to Sayyaf in Afghanistan. This may have led to a split, but Khattab was assassinated by Russia in 2002. Basayev took command of the IIB’s Chechen fighters, while Khattab’s successor, Abu Walid, took the foreign fighters. Abu Walid
was both able to continue fundraising, and was willing to cooperate with Maskhadov’s forces against Russia.

A major split in the separatists did finally occur in 2002, but it did so in a way that did not encourage the commanders to seek sponsorship. Russia began to call for peace talks around 2000. Recognizing that Russia had superior troops this time around, Maskhadov’s strategy was to use the rebellions ability to deny Russia victory as a bargaining chip in gaining autonomy and ending the conflict. This meant that he had to distance himself from the increasing slate of terrorist attacks conducted by the Wahabist groups. He publicly condemned 9/11 and al Qaeda’s actions in 2001. Maskhadov also relied on local support to sustain his operation, both for recruiting and fundraising. He had to maintain a careful balance between moderately religious, and nationalist secularist in order to maintain his base of support. He therefore both alienated al Qaeda and their donor network, and had a base of support that would collapse if he tried to shift ideologically. Maskhadov therefore primarily targeted the military.

The Wahabist groups, on the other hand, opposed peace with Russia and engaged in a campaign of violent attacks. In 2002, two events occurred. Abu Walid led an attack bringing down an M16 helicopter in coordination with Maskhadov. This helped him solidify his new leadership position and prove himself, while also signaling cooperation with Maskhadov. Meanwhile, Barayov, lead an attack on a theater in Moscow, taking over 800 hostages. Over 100 hostages were killed in the attack, primarily by narcotic gas used by the Russians while storming the theater. This caused outrage in Moscow. Putin vowed to crush the separatists and arrested Maskhadov’s deputy who had been in the process of informal peace talks.
The theater attack turned out to be a route by Basayev. He broke with Maskhadov and announced a new rebel group, the Riyadus-Salikhin Reconnaissance and Sabotage Battalion of Chechen Martyrs (RAS). He announced that Basayev was a subordinate commander in the RAS who had carried out the theater attack on Basayev’s behalf.

Basayev’s route gave him dominance among the separatists while finally driving a wedge between himself and Maskhadov. Maskhadov’s entire strategy was undermined and his forces were weakened, but he was unable to seek external funding because the remainder of his force relied on his moderate views, and because he had publicly opposed al Qaeda. He was not in a position to even consider seeking sponsorship. With Basayev as the new strongman, he was the new candidate for sponsorship, but he was no longer interested because he had successfully dominated the playing field on his own.

The separatists did eventually decline, but they did so in the face of Russian force, reducing their appeal as a potential base at a time when al Qaeda was already suffering from assassination campaigns by the US in its home territory. Khattab’s assassination was a taste of what was to come. Abu Walid was assassinated two years later. Basayev two years after that, and he was succeeded by a revolving door of leaders. These decapitations led to conflict within the ranks, until the emergence of Dokka Umarov, who was able to unite the remaining rebel groups under the Republic of Ichkeria. As the organization continued to suffer defeats, he made an attempt to expand outward throughout the Caucasus, declaring himself as emir of the Caucasus Emirates. This was a way to expand his base of recruitment and area of operations into relative safety. The Caucasus Emirates was never actually sponsored by al Qaeda, despite the claims of Russian state media. Russia had an interest in portraying the group as a part of al Qaeda in order to justify
continued action in the region, and tried to claim a link throughout the second war and the ensuing counterinsurgency. Umaraov has been very careful to emphasize that his organization is not al Qaeda affiliated. But the Caucuses Emirates continued to weaken, until it individual commanders began declaring allegiance to ISIL in the hopes of regaining some international relevance again.

In sum, al Qaeda had an interest in involvement in Chechniya, where Islamist groups had secure control of territory in a struggle against a world superpower occupying Muslim-majority lands. But the resistance remained sufficiently strong, and unified, for long enough to resist al Qaeda. When fractures did occur, the weaker party that might have benefitted from sponsorship was unable to seek it because of the nature of its domestic constituency. And the party that was an ideal candidate, Basayev, was too strong to need it.

1.4.6 Somalia

Al-Ittihad al-Islami (AIAI) was a Salafist group in Somalia. It consisted of a network of religious organizations from judiciaries to local governing bodies that had mostly existed since the 60’s, but came together under the AIAI umbrella. The organization was led by Sheikh Ali Warsame, but local commanders had relative autonomy. The AIAI became more militant throughout the late 80’s in opposition to Siad Barre increasingly barbaric rule. The militant wing came under the command of Warsame’s son in law, Hassan Dahir Aweys. AIAI was Salafist, while the Somali population was largely Sufi, a much more moderate sect of Islam. AIAI was able to grow quickly by capitalizing on opposition to Barre, and recruiting through university campuses. But with Barre deposed in 1991, the group’s aims shifted to establishing an Islamic
state. Their aims therefore aligned closely with al Qaeda’s. But at the time of bin Laden’s arrival in Sudan, AIAI was still making the transition from a political opposition group to a strong armed actor, and was only just beginning to build its network of courts.

After the defeat of the Soviets in Afghanistan, bin Laden tried to expand his operations to Africa (Fisk, 1993). He moved his headquarters to Sudan, from where he began making inroads into Somalia. Bin Laden was searching for a potential area of operations from which to launch attacks into neighboring countries. Somalia had only a handful of Islamic political groups, with even fewer violent groups (International Crisis Group, 2005). The AIAI, with their broader regional vision, seemed like a perfect candidate. Moreover, the AIAI operated in the Ogden along the border to Ethiopia, which made for an ideal staging ground into Ethiopia.

Al Qaeda participated in a handful of campaigns alongside General Aidid against the US and UN peacekeepers, but after the fall of Aidid was left without a strong local group to sponsor. Al Qaeda attempted to engage with AIAI, and built personal relationships with commanders within AIAI who may have joined al Qaeda in committing the US embassy bombings in Nairobi and Dar es Salaam, but quickly discovered that the group did not yet have the command and control, or military strength to be able to be a viable partner. There was internal division within AIAI about their role as a military organization. Al Qaeda eventually decided that it was better to cut their losses in Somalia, and gave up on sponsorship.

After the fall of Barre, and the UN peacekeeping operation targeting General Aidid, a power vacuum allowed AIAI to contribute to the building of local governance structures which

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*z Harmony Document: AFGP-2002-800581
*a Harmony Document: AFGP-2002-800597
*b For a detailed case study of al Qaeda in Somalia, see (Watts et al., 2007). Many of the facts presented here were described by Watts and colleagues.
combined tribal order with Islamic courts, thereby extending AIAI’s reach. AIAI was able to expand because of the desperate need for security and governance across Somalia.

The Islamic Courts Union ICU grew out of the court and governance systems put in place by the AIAI, and ruled from 2006 to early 2007. It was a broad-based group which was maintained by the support of clan elders based on the success of the group’s predecessor’s court system. Radical Islamism, however, did not have broad support in Somalia. The organization was still not a unified group capable of attracting al Qaeda. There was also internal debate about whether they should. It was becoming increasingly difficult to argue that their war against the state and African peacekeepers was legitimate. Warsame eventually called a conference of leaders within the ICU to announce that Somalia was not ready for an Islamic government because the group could not hope to coopt sufficient public support for a transformation of the state. Instead, he argued, they should move towards reconciliation with the state.

Two commanders within the ICU, Godane and Ayrow, walked out from Warsame’s announcement and immediately called a conference of their own, forming al Shabaab in 2007. Al Shabaab was able to grow because of the Ethiopian intervention beginning in 2006, by framing the conflict as a struggle against foreign occupation (Mendelsohn, 2016).

Al Shabaab launched a successful insurgency. By 2009 they controlled large swaths of the country, including the capital. It was around this time that al Shabaab first made bids to join al Qaeda. Why would they do so, when they appeared to be at the height of their power?

The conflict had attracted a flow of foreign support and fighters, which exacerbated internal tensions. Warsame was correct that the Somali population was not Salafi and was hostile to

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cc (“No Al-Qa’idah in Somalia, says Islamist leader,” 2007, p.)
foreign fighters. As Ethiopia withdrew, they faced challenges maintaining domestic support, and
had to choose between embracing domestic demands in order to create domestic legitimacy, or
pursuing foreign flows of funds and fighters. Given the lack of support for Salafism and historic
failures to establish an Islamic state in Somalia, it is likely that al Shabaab anticipated difficulty
in maintaining their newly won territory or sustaining the organization once Ethiopia left
(Mendelsohn, 2016).

At least as important as the lack of support among the population was the tension among the
leadership of al Shabaab (Aynete, 2012; Mendelsohn, 2016). Al Shabaab’s first in command,
Ahmed Abdi Godane, preferred a globalist strategy. Others, such as commanders such as
Mukhtar Robow, Abu Mansour, and Sheikh Hussan Dahir Aweys, did not. Commanders within
al Shabaab threatened to engage in talks with security forces to end the conflict.

Godane knew that without a base of support, and with commanders within the organization
ready to defect, the only way for al Shabaab to survive was by seeking international legitimacy.
With the war with Ethiopia drawing to a close, future survival depended on keeping the support
of foreign fighters.

So, in 2009, Godane began making inroads to al Qaeda through public declarations of support.
Al Qaeda responded with a video in which bin Laden encouraged foreign fighters to flock to
Somalia, and for them to fight on. This had the expected effect: it caused backlash among those
preferring a Somalia-focused strategy, and it energized foreign fighters. Godone responded by
publicly pledging their allegiance to bin Laden.

For example, see (“Al-Shabab militant Zakariya Ahmed Ismail Hersi ‘surrenders,’” 2014)
Bin Laden initially rejected their Bayat because he did not believe the organization had a strong enough position to survive the sponsorship, or that it would be able to maintain command and control in the long term. The public outcry was evidence of internal divisions. Moreover, a top al Qaeda advisor stationed in Somalia, Mohammed Fazel, opposed the merger because of the internal divisions. Bin Laden also likely remembered his earlier forays into Somalia, the preeminence of tribal politics and the resulting factionalizing of Islamist groups, and the disorganization of the ICU. Fazel’s continued concern over al Shabab’s unity and their past with the ICU was likely damning.\textsuperscript{ee}

Bin Laden expressed his concern over the ability of the population to support jihad, especially with the global spotlight that would result from al Qaeda membership. In a letter to al Shabaab leader Mukhtar Abu al-Zubayr, bin Laden explained that while he supported what al Shabaab was doing, that al Shabaab was not strong enough to withstand the pressure that would come with being an al Qaeda affiliate. Without public support, they would be unable to handle the increased international pressure.\textsuperscript{ff} Zawahiri disagreed, and wrote to bin Laden urging him to reconsider. Zawahiri concern was that now that al Shabaab has already pledged allegiance, that it would be worse for al Qaeda to recant. But he goes on to discuss the problem of declarations of membership among those who do not have al Qaeda’s support, suggesting that he also believes that al Shabaab is strong enough, and has sufficient professionalism to be a trusted steward of the al Qaeda name.\textsuperscript{gg}

\textsuperscript{ee} In fact, Fazul was part of the Godane’s purge.
\textsuperscript{ff} Harmony documents: SOCOM-2012-0000006, SOCOM-2012-0000005
Two years later, shortly after the death of bin Laden, Zawahiri did accept al Shabaab. This was likely at least in part because al Qaeda, still reeling from bin Laden’s death, wanted to show that they were still relevant, and in part because Zawahiri had believed al Shabaab was strong enough to begin with. Moreover, Godane had engaged in a purge of his rivals, helping him to consolidate control over his organization. Despite a loss of some of its territory, al Shabaab had also demonstrated their ability to withstand the renewed onslaught from the African Union, Ethiopia, and Kenya. Even though he controlled less territory than he had before, and his needs for legitimation were even stronger, he had still demonstrated himself in the two areas where bin Laden had expressed concern. On the part of al Shabaab, Godane was all the more desperate for al Qaeda recognition when he finally received al Qaeda sponsorship. A thinning of forces from a draught and the purge of his rivals meant that he was in need of more foreign sources of support and recognition (Mendelsohn, 2016).

1.5 CONCLUSIONS AND IMPLICATIONS

The cases above illustrate a common theme to al Qaeda’s sponsorships. Al Qaeda preferred strong groups, even when that created tensions between al Qaeda’s goals, and the local group’s goals. Weak groups could not provide secure access to territory, and required large investments of resources for little return. Al Qaeda was initially wary about engaging with the Taliban, abandoned AIAI, and was hesitant to fully support al Shabaab until they were certain they had overcome their command and control issues.

Looking at sponsorships from the local perspective, groups were only willing to partner with al Qaeda when they required access to goods that al Qaeda specialized in, and that they could not
access on their own. Haqqani benefited from al Qaeda’s training camps and source of recruits. Having access to al Qaeda’s support helped Haqqani to maintain his relative autonomy despite being an otherwise small fish in the Pashtun region of Afghanistan. Hekmatyar needed support to move past a stalemate. The Taliban, which was strong enough to exist without al Qaeda, was a grudging host that threatened to try to remove al Qaeda, but couldn’t because of Haqqani and Younis Khalis’ protection. GSPC only sought al Qaeda support after their rebranding failed. Al Shabaab wanted support because the lack of domestic support meant they needed continued access to global flows of recruits. Across the world, groups requiring a source of prestige and legitimacy pursued the al Qaeda name, which al Qaeda only gave out to groups that were strong enough to defend it.

Taken together, the case studies tell a story of the rise of al Qaeda as a transregional actor, and has broader implications for global violence writ large. Al Qaeda was able to strategically use partnerships to grow from a group of malcontents in the teahouses of Peshawar, funneling money and occasionally playing with guns, to a global actor, hegemonic in their power within the non-state actor system. Bin Laden had global ideas, making him a transregional actor, but al Qaeda sponsorship in Afghanistan was inherently different from al Qaeda sponsorship of al Shabaab.

In the beginning, all al Qaeda could offer Hekmatyar and Haqqani was construction equipment and another path of funds and fighters from Arab countries. Their international network and bin Laden’s construction business gave them some asset specificity. In the bloody Afghan war, where access to funds and any comparative advantage was the difference between elimination and survival, Haqqani was willing to trade access to his territory for the efficiency that working with bin Laden provided. It was through that war that bin Laden was able to gain
experience and build networks of personal relationships and the notoriety that that eventually allowed him to confer legitimacy on others.

Al Qaeda was able to use strategic sponsorships to increase their global notoriety and power. Many partnerships differed in their scope and scale, but each new partnership allowed al Qaeda to extend its reach and its global partnership, leading to hegemonic power within the Islamist non-state system. But the strategy that led to al Qaeda's rise may also be its downfall.

Taken to its extreme, the theory presented here implies the emergence of competition. Al Qaeda depends on strong partners, but strong partners prefer autonomy. That means that al Qaeda's affiliates should only be willing to allow al Qaeda to extend its reach into their territory if they continue to need al Qaeda's support. But al Qaeda's support helps to strengthen these groups, thereby increasing their demands for autonomy. When groups need legitimation or access to al Qaeda networks, the relationship can be sticky. But by empowering the groups that it sponsors, al Qaeda is creating potential rivals. This is what happened in the case of al Qaeda in Iraq (AQI).

Al Qaeda gained notoriety in part because global attention was on the war in Afghanistan while al Qaeda was present. When America shifted its focus to Iraq, global attention shifted as well. There was a new hot war attracting fighters. In order to maintain their position as global leaders, al Qaeda needed to be present in Iraq as well, but al Qaeda did not have an on-the-ground presence. Instead, they relied on Zarqawi's Tawhid Wal Jihad, which became AQI.

Young jihadists from around the world sent their fighters to Iraq. The legitimacy granted by the al Qaeda name meant that many foreign fighters flocked to Zarqawi. Smuggling networks were set up to channel fighters to Iraq (Mendelsohn, 2016), and fighters came and went home,
which helped Zarqawi to build a global network of his own. On the one hand, because he was an affiliate, his success was al Qaeda's success. For example, it was because of the connections made through foreign fighters in Iraq that the GSPC was able to appeal, in part via Zarqawi, to al Qaeda core for sponsorship. But on the other hand, al Qaeda was losing its asset specificity: as the face of the jihad in Iraq, Zarqawi had his own legitimacy and had built his own global networks. He no longer needed al Qaeda and could increasingly ignore their directives. AQI even changed its name to the Islamic State in Iraq, and once the conflict in Syria started and presented them with their own opportunity to expand, the Islamic State in Iraq and Syria (ISIS).

It was because they had been empowered by al Qaeda that AQI was able to emerge as a contender for hegemony in the jihadist system. It is not Waltz' balance of power or Walt's balance of threat that shapes militant group networks (Christia, 2012; Karmon, 2005; Walt, 1985; Waltz, 2010), but Gilpin's hegemonic theory of war and Organski's power transition theory (Gilpin, 1988; Organski, 1968). At the height of its power, al Qaeda was able to create relative unity among jihadist forces and act as a purveyor of legitimacy among Salafists. But by creating a system in which their partners were empowered, they facilitated the rise of ISIS. ISIS and al Qaeda are engaged in a competition for leadership of global jihad, each expanding and competing in theaters across the globe.
CHAPTER II
ANTI-SOCIAL NETWORKS: THE EFFECTS OF VIOLENT GROUP COOPERATIVE NETWORK STRUCTURE ON CAPACITY FOR VIOLENCE AND SURVIVAL

2.1 INTRODUCTION

What is it about al Qaeda that makes them such a persistent threat? It cannot be their individual capacity alone: al Qaeda core consists of only a few thousand fighters that no longer control territory. Other groups are have taken over whole states. Their forces are well trained, but hardly make up an army, as those of some violent groups do. Al Qaeda is a threat because of their global network. They act to coordinate the broader jihadist network, even cooperating with ideologically non-aligned groups when it needed brings resources and knowledge into the network. Al Qaeda was so effective not just because of the attacks they committed directly, but because of the way they influenced other groups all over the world. While al Qaeda, and to some extent now the Islamic State in Iraq and the Levant (ISIL), may be unique in their scope, they are not unique in their method.

Militant groups do not exist in isolation. They train together, trade together, conduct joint operations, and share infrastructure, using cooperation to boost their own capacity to act and survive. They share in one another’s successes, and failures. But the success or failure of a group is shaped by the success or failure of its partners, and those partners are affected by their partners, resulting in chain reactions that propagate across the network. Groups cannot act without affecting one another, and thus cannot be fully understood without considering the context of their partnership network.

Just like the structure of a pipe system shapes the ways in which water flows through the system, so too does the structure of partnerships shape the way that information, goods, and
vulnerabilities flow between groups. The nature of the inter-organizational militant network affects the ways in which tactics and technology diffuse between groups. It mediates the flow of funds, weapons, and intelligence. A group's position in their local network affects their access to critical resources, and the ways in which the group learns from the successes and failures of other groups. This in turn affects a group’s vulnerabilities, and has implications for which counter-terror or counter-insurgency strategies should be more effective against which groups. In this paper, I present a network theory of militant group partnerships to explore the effects of local network structure on violent group capacity, and test the effect on capacity to carry out attacks and survive.

Important group-level outcomes such as survival and capacity for violence are shaped not just by the partners a group has, but the pattern of partnerships throughout a group’s local network. Some local networks, called centralized networks, consist of one or a few well-connected groups, and many groups with few partners. The clearest example of a centralized local network is the network of partnership surrounding al Qaeda. In these networks, the well-connected groups have leverage because they can influence the network as a whole, and because they can threaten to cut groups off from access to the network. I argue that well-connected groups within centralized local networks specialize in order to coordinate the network and vet potential members. This coordination helps all members of the local network to survive longer and mobilize resources for sustained violence.

Other, flatter, local networks contain groups with on average have the same number of partners. An example of a flatter local network is the Kashmiri network of violent actors on the Pakistan-India border. In these networks, groups may be highly connected, but no group
dominates, or has more leverage than, other members. There are no specialized coordinators, so groups are left to manage their partnerships on their own. Since more groups have more partners, there is less screening of members, meaning that one group’s poor judgement when partnering with a vulnerable group can compromise the entire local network. I find that on the whole, members of flat, decentralized, local networks are more vulnerable and have reduced capacity for violence.

While all groups in a network are interdependent, those groups which are more closely connected exert a greater influence on one another. Groups can be directly impacted by their partners: al Qaeda operatives benefit from the safe-house network among Pakistani groups. Groups are also impacted by their partners’ partners, and so on: the safety of al Qaeda operatives in Pakistan affects all of al Qaeda’s partners, which in turn affects their partners. However, the more links separating two groups in a partnership network, the less impact they have on one another. Moreover, local asymmetries in partnerships lead to leverage at the local level: a group cannot threaten to break ties with another group if they were not tied to begin with. Leverage and power relations are local, and are exerted among groups that are directly partnered or closely related. Because of the local nature of power relations, I focus here on local networks. As used here, a group’s local network refers to its partners, and its partners’ partners, as well as considering the ways in which those groups are situated in the broader network.

It is intuitive that groups should be affected by their partners. Groups share intelligence and resources, trade, teach one another, and share secret information that could leave them vulnerable.

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This can be illustrated with a simple example. Say a group is compromised and loses information about each of its partners. Some of that information is useful to security forces and may contribute in efforts to target the group’s partners, but not every partner will be compromised. Therefore, not all of partners of partners of the original group become vulnerable, and so on.
if exposed. The major innovation in this paper is to show that it is not just a groups’ direct partners that constrain that group. The structure of the relationships shapes the ways in which those relationships constrain behavior and interactions, which in turn shapes the extent to which groups can draw on resources within the network to increase their capacity.

Previous studies on how militant group networks shape group behavior have focused only on the first part of the puzzle: the effect of a group’s position within a network. These have focused on the direct partners a group has. Groups with more connections are more lethal (Asal & Rethemeyer, 2008a), and survive longer (Phillips, 2013). Similarly, using a measure\textsuperscript{ii} of a group’s partnerships that recursively weights those partnerships by the partners each partner holds, groups with more influential partnerships are also found to be more lethal (Horowitz & Potter, 2013), but not more long-lived (Phillips, 2013).

Only one study has considered the effects of network structure, finding that fragmented, less interconnected militant networks produce less violent free-riding than less fragmented networks in which groups are more interconnected (Metternich et al 2013). No one has yet looked at the interaction between position (a group’s partners) and structure (the pattern in which those partners are arranged), or the effect of network centralization. But centralized networks look very different from decentralized networks. They are often hierarchical, with well-connected groups that are able to impose order on the network as a whole. As such, they should result in very different network flows, and impose different behavioral constraints on groups. Theorizing about position without structure leads to an incomplete story.

\textsuperscript{ii} Horowitz and Potter use eigenvector centrality, which takes the eigenvector of the dominant eigenvalue for an adjacency matrix. Eigenvector centrality measures the influence of each node in a network by recursively weighting each group’s influence by how well connected it is to other influential groups.
The paper is structured as follows. I will begin by discussing partnerships between violent actors. I will then theorize about positional effects, briefly reviewing the limited literature on terrorist alliance networks as I go. I will then transition into a discussion of network structure, both how it evolves and the ways in which it constrains groups. I will propose a theoretical framework through which to classify these structures, and discuss the implications of these structures for group behavior. I will propose and then test several implications of the framework empirically to demonstrate the importance of structural considerations.

2.2 THEORY

2.2.1 MILITANT GROUP PARTNERSHIPS

Partnerships, because they involve sharing information, are inherently risky for illicit organizations. And yet, despite the fact that they depend on secrecy to survive, exist under conditions of anarchy\(^\text{ii}\), and are inherently criminal, violent non-state organizations make a lot of friends. Prominent examples include the People’s Liberation Front of Palestine (PFLP) and the Baader Meinhoff group in Germany, Hamas and Hezbollah, al Qaeda with the Salafist Group for Preaching and Combat (GSPC/ AQIM), the Provisional Irish Republican Army (PIRA) with the Revolutionary Armed Forces of Colombia (FARC), and the Taliban and Hezb-e-Islami. Each of these examples represents a contextually distinct form of partnership, yet all have inherent similarities that make them directly comparable as part of a single network.

\(^{ii}\) As illicit organizations, violent non-state actors cannot appeal to contract enforcer, or to a state to protect their security. They are therefore existentially vulnerable to both states, and non-state competitors.
Despite their differences, each example is a demonstration of how partnerships can benefit groups by creating efficiencies from cooperation. These efficiencies often arise from asset specificity: different groups are good at, or have access to, different things. This makes it efficient for them to cooperate (Wahedi, working paper). The PFLP and Baader Meinhoff were loosely ideologically aligned, but primarily interested in their own internal conflicts. By partnering, they could pool resources to accomplish larger scale attacks that aligned with both of their needs. Along similar lines, al Qaeda operatives rely on a network of safe houses built by illicit groups in Pakistan.

The GSPC became a formal franchise of al Qaeda and dedicated itself to al Qaeda’s ideology, but again, both groups benefited from efficiencies due to cooperation (Wahedi, working paper). Al Qaeda got a reputation boost as a global leader, became able to freeride on their new namesake’s efforts, and received revenue from African smuggling routes. The GSPC received legitimacy and new sources of recruits by joining the al Qaeda franchise.

PIRA and FARC had a more direct transactional relationship, in which they traded expertise in bomb-making for weapons. Finally, Hezb-e-Islami and the Taliban were two parties to a civil war that took turns fighting and aligning. Where they partnered, they did so because pooling their forces allowed them to eliminate a mutual foe, where doing so alone might have been resource prohibitive.

All of these examples represent very different sorts of relationships, and yet, they all have a common current. Violent non-state actors cooperate, especially with those with whom their interests align either temporarily or in the long term, to do things that would be more costly alone. Partnerships can take different forms, and yet have similar effects on group capacity to
survive hard times, (like the Taliban and Hezb-e-Islami, or the GSPC with al Qaeda,) or to accomplish more than they could alone, (like the PFLP and Baader Meinhoff, or PIRA and FARC.)

2.2.2 BEYOND THE DYAD

This common thread describes the key currency described in this paper: partnerships generate both costs and efficiencies. But partnerships don’t exist in isolation. Al Qaeda’s appeal to the GSPC was that the group had access to a global network. The PFLP was capable in part because of its global network. No group would be able to fight without the arms networks that supply their weapons, or to survive without the smuggling networks that provide them with revenue. Just like in the global economic system, efficiencies flow across the network enabling and constraining groups. How this flow affects groups depends both on the structure of their local network neighborhood, and their position in it. I will begin by describing the role of position, followed by the role of local structure and how it interacts with position.

2.2.3 POSITION

On the whole, groups that are better connected are better positioned to extract efficiencies from a network of partnerships because they have greater access to network resources and greater leverage over their partners. However, having more partners can come with a cost.

Better connected groups have greater access to goods that flow across the network. In illicit networks, these goods include intelligence, access to safe houses, training, and black market trade routes. Groups can gain increased access either by connecting to other well-connected
groups, or by forming many connections on their own. For example, during the Afghan Civil War, most commanders partnered with groups with a presence in Peshawar in order to access funds from global networks, rather than devoting energy to cultivating these funds on their own. The Shura-e-Nazar served as a way for Ahmad Shah Massoud of Jamiat-e-Islami to manage connections to local commanders in order to funnel resources to them through Peshawar. The Haqqani Network used a different strategy than members of Shura-e-Nazar, partnering with the larger Hezb-e-Islami, but also directly creating its own network of donors.

The Afghan Civil War example illustrates several mechanisms by which groups benefit from their partners. First, having greater access to network resources helps groups bolster their capacity both to survive and to engage in violence. Hezb-e-Islami and Jamiat-e-Islami were among the most powerful groups in Afghanistan in large part because they were so well funded through Peshawar. Groups that had been cut off from Peshawar either perished or partnered with one of the Peshawar parties (Amstutz, 1994). Local commanders in the Shura-e-Nazar could access the resources coming through Peshawar through Jamiat-e-Islami, but were one more step removed from the broader network, making them less well connected. It is worth noting the endogenous nature of this mechanism: coordinators in Peshawar preferred Massoud in part because of his capacity, but his capacity was maintained by this connection. Both necessarily occur simultaneously and feed back into one another. Local commanders in the Shura-e-Nazar were not picked as a favorite, in part they weaker to begin with, but that they were not picked still constrained their capacity to grow in their own right.

This first mechanism captures the logic that when a group’s partners are doing well, that group does well. For instance, the flow of intelligence is well captured by this mechanism,
because groups need not be partnered with the source of the intelligence to benefit from that intelligence. Black market trade is another fluid network good: having a trade partner that can get access to, or find buyers for, diverse goods may be more efficient for a group than finding and building trust with many trade partners directly. Other types of network goods do require direct partnership, which leads to the second mechanism.

The second mechanism by which better connected groups benefit is through greater access to network goods through their direct partnerships. Groups with more direct partners are likely to achieve contextualized intelligence, have more exposure to violent innovations, have access to greater resource flows as they traverse the network. Moreover, not all goods flow through the network equally well. Some goods, such as the sharing of infrastructure, might be better captured by direct partnerships. Groups may benefit when their partners have access to infrastructure, but they do not benefit as much as having direct access. For example, al Qaeda’s partners train at al Qaeda training camps, and return home to teach their compatriots the techniques they learned. Not every second order partner will learn, or learn as well, as the groups whose operatives directly trained with al Qaeda. This means that in addition to benefitting from indirect access, groups can benefit more from direct access.

Third, groups can benefit from having more ways to access network flows. This is because of how forming pathways shapes the leverage groups have. Groups with many partners are more likely to have greater leverage within their relationships, because they can threaten to cut their partners off from the rest of the network. This allows them to have greater sway and to take a greater share of network resources. Jamiat-e-Islami had leverage over the members of Shura-e-Nazar because it was their only access to the resources that enabled them to survive. This
allowed Jamiat-e-Islami to extract concessions, helped Massoud to maintain his leadership, and placed Massoud in a better position to seize national power if Jamiat won the war. Al Qaeda’s affiliates pay homage to al Qaeda in part because they depend on al Qaeda for access to legitimacy and a global network, which further boosts al Qaeda’s legitimacy.

Forming redundant partnerships shifts the leverage between groups, helping dependent groups to regain some autonomy. The Haqqani network was less dependent on Hezb-e-Islami because they had their own donor network (Peters, 2012a). This gave them greater territorial autonomy and allowed them to coordinate with al Qaeda. Access to the global network helped entrench the group, helping them survive the civil war, and the war with the US. The Haqqani Network remains active today. Similarly, al Qaeda in Iraq used the global focus on the war, and its influence as an al Qaeda affiliate, to build redundant connections to the groups that sent foreign fighters through al Qaeda. This allowed al Qaeda in Iraq to gain in strength and global legitimacy, and eventually challenge al Qaeda’s leadership as the Islamic State in Iraq, and later the Islamic State in Iraq and the Levant.

This mechanism is also part of an endogenous process. Groups can only form more partnerships if they can get other groups to partner with them, which only occurs if they have the resources to invest in maintaining those partnerships, and have something valuable to offer. But forming those partnerships feeds back in to group capacity. On the other hand, groups main focus is on their individual conflict, meaning that any resources dedicated toward forming a network are diverted from their primary goals. This means that group strength and propensity to form ties may be correlated, but neither fully explains variation in the other.

Hypothesis 1: Better-connected groups have greater capacity for violence and to survive
The benefits described above are coupled with costs. Maintaining many partnerships creates an administrative burden on groups. It costs time and resources in order to maintain any partnership, let alone a covert one in which groups must conceal their actions and trust one another. Partnership is also risky because a partner could be compromised by security forces—as the Islamic Group of Algeria (GIA) was—or could switch sides (Bapat & Bond, 2012)—as Yunis Khalis eventually did to Hezb-e-Islami (Christia, 2012). In either case, secret information that could damage a group would be lost to its enemies. This suggests that there may be diminishing returns to some partnerships, a point I will revisit when discussing the impact of network structure.

2.2.4 Conceptualizing Structure

The theory on positions described above is incomplete without considering the context of the partnerships between groups. For example, if redundant pathways exist, then well-connected groups are no longer the only source of goods or information, thereby reducing their leverage. Having more connections may allow groups to have more leverage, but that can be countered by other groups forming more partnerships. The context within which a group exists determines the returns to each partnership.

Compare the local violent networks marked C in Figure 2.1 to the local networks marked A and B. Well-connected groups in the collection of stars marked C have leverage over their partners because they could threaten to cut them off. Groups with a similar number of connections in A and B do not have leverage because there are many redundant paths: a group cannot impose costs on a partner by severing a relationship because the partner has many
alternatives for accessing network resources. Returning to the Afghan war example: Haqqani was less dependent on Hezb-e-Islami than the Shura-e-Nazar groups were on Jamiat-e-Islami. This means that the returns to partnership depend on the context of partnerships within the broader network.

The local networks marked C and A and B exist at two ends of the spectrum of network centralization. Centralized networks consist of one or a few groups with many partnerships, and many groups with few partnerships. The local networks around C are examples of hub-and-spoke networks, and are at an extreme of centralization. In them, one group has a maximum number of relationships, while all others have the minimum number. Less extreme is the network marked D, in which some of the poorly connected groups have two connections. Centralized networks can also have more than one well-connected group, each with many poorly connected partners of their own, as appears among the European leftist groups in the local communities marked F & G. Three well-connected groups, the Revolutionary People's Struggle, The Revolutionary Organization of 17 November (17N), and Kurdistan Workers Party (PKK) are each connected as well as surrounded by many poorly-connected groups. Local networks can also can exist as extensions out from a larger centralized network, like al Qaeda in Iraq’s network of local partners in E2, extending out from al Qaeda’s broader centralized network in E.

At the other extreme are decentralized local networks, in which most groups have on average the same number of partners. In A, every group is partnered with every other group. In B, most groups have the same number of partnerships. The Kashmiri groups marked E2 are another example a decentralized local-network. In these networks, there are redundant pathways, which reduces the leverage that any group has over another.
Network structures shapes the flow of goods and information across the network, which in turn has positive and negative consequences for the groups that make up the network. I will discuss the theoretical implications of each end of the centralization spectrum in turn, incorporating a discussion of how these structures interact with position within the structure. The local structure of a group’s immediate neighborhood should be especially important for shaping behavior. I therefore focus specifically on the structure of the local community in which groups exist, rather than on the broader network containing all violent groups.

2.2.5 Decentralized Local Networks

Decentralized networks have several features that provide both benefits and weaknesses. First, they have many paths for goods and information to traverse (Moody & White, 2003). This redundancy allows groups unfettered access to more fluid network goods such as intelligence and small arms, and gives individual groups greater autonomy. Groups are not reliant on brokers who control the flow of goods and information, because redundant paths mean that there are always alternatives to cooperating with a given group. Al Qaeda in Iraq and al Qaeda in the Islamic Maghreb both formed their own networks as they increased their independence from al Qaeda Core. The Haqqani Network operated relatively autonomously, even though they were in Hezb-e-Islami’s territory in Afghanistan, in part because it had its own network and was not as dependent on Hezb-e-Islami for funding.

Redundant ties may increase a group’s autonomy, but that comes at the cost of efficiency. Because there are many paths between nodes in an interconnected network, there are decreasing marginal returns to adding ties: a group only needs one partner that can supply small arms, and
does not benefit from hearing the same intelligence twice. Managing many redundant ties is costly. Maintaining an illicit relationship requires an investment of time and risks exposure. In order for the flow of network goods and information to benefit a group, they must have sufficient capacity to process the flow. While groups in decentralized networks have access to a lot of information, their ability to process it and transform it into violent innovations may be decreased by the quantity of information they process.

Too many connections results in a phenomenon called saturation. In experimental studies, having a few sources of information improves a node’s performance. Having too many adds noise and causes it to redirect resources that could be spent on productive tasks to the task of sorting through the information, resulting in an overall decrease in performance. Violent groups are organizations of individuals, not individuals, but the principle is the same. Groups with finite resources can only manage so many relationships, and trying to balance too many means less attention and trust building among each, reducing the overall returns to partnership. Saturation effects may be why no observed interconnected militant community above size five is fully connected, suggesting that negative returns to degree have not been reached in the observed network of militant groups.

Given the theoretical expectation that violent networks should be sparse, and the lack of dense communities in observed networks, there should be no strong effects of density on group behavior, outside of its relation to other structural attributes (See Supplemental Material).

Second, redundant paths reduce a network’s vulnerability to the removal of groups from the network. Network goods can still flow, even when members of the network are removed. In an
interconnected small arms network, the elimination of one dealer does not halt the flow of weapons.

On the flip side, networks with redundant paths are vulnerable to unraveling strategies. If security forces infiltrate or arrest one vulnerable group, they can collect intelligence against many others, compromising their partners in turn. This was one of the downfalls of the armed Islamic Group of Algeria (GIA): they were infiltrated by security forces, making commanders during the civil war hesitant to work with them. Illicit interconnected networks are therefore only as strong as their weakest member. Moreover, members of these networks cannot control who has membership on an individual basis.

A final feature of interconnected networks is that they are subject to free riding and reduced overall effort (Bramoullé, Kranton, & D’Amours, 2011, 2014; Metternich, Dorff, Gallop, Weschle, & Ward, 2013). Initiative taking becomes less common, and members tend to settle on

Figure 2.1. Cooperative Partnerships Among Violent Actors. Network data taken from the Big Allied and Dangerous Dataset from the Terrorism Knowledge Base. Modular network communities were calculated and color coded using the Girvan-Newman Algorithm.
an overall suboptimal level of effort, in part because they wish to free ride on the violent efforts of their partners.

2.2.6 Centralized Communities

Centralized networks tend to be more hierarchical than decentralized networks. For example, al Qaeda requires its allies to formally declare allegiance, and imposes bureaucratic restrictions. The more central PFLP acted as a formal mentor to Baader Meinhoff and the Japanese Red Army. Hierarchy means that the accrual of goods and access to information interacts more strongly with a group’s position within the network. Baader Meinhoff complained about receiving too little in exchange for their partnership with the stronger PFLP, for example. In interconnected networks, goods flow through redundant paths, so even the most central groups have less leverage in an interconnected network than they do in a centralized network of similar size. In a centralized network, the majority of members are dependent on better-connected members for access to network goods.

Centralized networks have three primary network level benefits: they have short path lengths, are efficient, and are robust to the elimination of random groups. But like with interconnected networks, each of these benefits has a tradeoff: short path lengths depend on well-connected groups being willing to take on the costs of having many ties. Peripheral members trade freedom of action for efficiency. Centralized networks are vulnerable to targeted elimination of members.

Centralized systems are good at diffusing useful information—especially in large networks—because the shape of the network facilitates fast information flow. Well-connected groups serve as information short-cuts. In a simple hub-and-spoke network, in order for information to pass from any member to any other member, it must pass through at most one intermediary (Cohen &
Havlin, 2003). Because most information and resources pass through just a few well-connected groups, these groups can contextualize that information and prioritize redistribution, facilitating the flow of network goods. Denser interconnected networks may have similar path lengths to less extreme centralized networks, but the flow of information is less contextualized or coordinated. Moreover, achieving the same level of closeness between each member is much costlier in decentralized networks, leads to the second benefit of centralized networks: their efficiency.

Centralized networks are more efficient because the network as a whole invests less in processing information. Each tie is costly. Hub-and-spoke networks are the most efficient because they allow the greatest flow of information for the lowest maintenance cost. Centralized networks minimize the distance between any two groups while also minimizing the number of partnerships needed.

Applied to the domain of violent organizations, centralized communities are efficient because they facilitate specialization. In a centralized system, a single group invests in the capacity to make and maintain many partnerships, which allows it to process incoming information from many groups and pass that information on to the rest. Examples include the Peshawar parties during the Afghan Civil War, which funneled funding from Pakistan to the lower-level commanders in Afghanistan, and thus controlled which groups had a fighting chance. The Shura-e-Nazar is an example of a specialized a structure constructed by Massoud within Jamiat-e-Islami to help manage these partnerships. Another example is the al Qaeda Core bureaucracy, which specializes maintenance of ties (Shapiro, 2007, 2008), and infrastructure building in partners. Both the Peshawar parties and al Qaeda invested in a bureaucracy, and in vetting of potential partners.
Third, the information flow through a centralized system can be filtered by the well-connected groups at the center. Processing information can be as costly as maintaining ties. Well-connected groups in centralized networks have visibility into the source of all information flows and are in a position to better contextualize it. They can then filter that information and pass it along to the partners that need it (Shapiro, 2007). This means that most groups in a centralized local network need to invest less in the capacity to process and synthesize information themselves. This can be seen in the al Qaeda network, where al Qaeda encourages groups to record lessons learned from their operations, and has the bureaucratic framework to process the information. Rather than passing along raw information to the rest of the network, it trains its partners in best practices and passes resources along to the groups that need it.

In decentralized networks where information and resources flow through so many redundant paths, no group can filter. Furthermore, in flat local networks, no single group is in a position to be able to contextualize the information. Finally, there is so much redundant information passing through any group that it is more difficult to process. So even though each group has access to all information, in large networks, they are less able to make use of that information. Having a single integrator helps make centralized networks particularly well suited to solving problems in the militant group context.

The first problem with this view of centralized networks is that highly central nodes are subject to saturation problems (Gilchrist, Shaw, & Walker, 1954). The saturation hypothesis was devised to explain variation in experiments on the effects of network form on problem solving and information flow. These experiments consisted of small networks of three to five people configured in different archetypal forms (Shaw, 1964). In general, hub-and-spoke networks
tended to solve simple problems more quickly (e.g.: Leavitt, 1951), while fully-connected networks were better at solving complex problems (Heise & Miller, 1951). Gilchrist and colleagues find that this effect is due to the fact that hubs are overtaxed when the problem involves greater communication. Across all experiments, hubs received and passed more messages than any individuals in any other position. If the problem exceeded their capacity to process information quickly, then the performance of the entire network suffered. As described above, when groups have limited personnel resources to divert from fighting toward managing their partnerships, they are also subject to saturation effects.

Saturation problems can be mediated in the context of centralized networks when well-connected groups benefit from having partners that are active. Dodds, Watts & Sabel (2003) find that hierarchical networks can actually be more efficient at solving communal problems if the problems being solved can be decomposed. Militant groups are independent entities which generally have their own local, immediate goals, which suggests that the problems they solve tend to be decomposable: the “problem” the system is trying to solve is individual group success. This means that centralized militant networks can effectively increase capacity for violence as long as they can resolve the saturation problem. Since these nodes are groups rather than individuals, they can invest in increasing their capacity to process and spread information, and allocate goods through the establishment of bureaucratic mechanisms as seen in al Qaeda and the Peshawar parties.

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kk The benefit to a centralized network is exemplified in the way brains process information, in which sensory input is aggregated by hub neurons. Many photoreceptors, for example, collect information about the world, but no amount of interconnection between these cells will lead to interpretation of that information without a hub integrating the signals of its subordinate neurons into a single, stronger signal to the conscious brain. Al Qaeda is like the hub neuron, which integrates the experiences of all of its subsidiaries in order to draw overall trends and create a strong, unified signal from the mass behavior of smaller groups in order to effect an outcome.
Taking on the bureaucratic costs of managing partnerships is worthwhile for well-connected groups if they receive greater benefit from the success of their partners than they would if they spent the resources they spend on information processing on achieving their own goals directly. For example, the moderate Peshawar parties were militarily weak, with only a few hundred fighters on the border. They relied on local commanders to whom they funneled resources in order to remain relevant (Amstutz, 1994). Because these specialized arbiters choose how to funnel resources, they can do so in such a way that helps them to further their own aims (Byman, 2014; Fishman, 2008).

The risk of saturation should be contrasted to the inefficiencies and free-riding that occurs in decentralized networks. In centralized local networks, well-connected groups specialize in funneling resources to partners in order to further their mutual aims. Enders & Jindapon (2010) find that in decentralized networks, even if nodes have the same goals, externalities can cause suboptimal decision-making, suggesting that decentralization may be disadvantageous when the goals of members of a network are less aligned, or when problems are harder. Both conditions likely the case with violent non-state actors (Byman, 2014; Shapiro & Siegel, 2007, 2012). Moreover, no group takes the initiative to process information in decentralized communities. All groups must therefore learn their own lessons from the abundant flow of information from diverse sources. In decentralized local networks, learning is less contextualized, and greater investments must be diverted from productive activities toward information processing and relationship maintenance.

Centralized networks are also good at solving collaboration problems, because well-connected groups can provide a focal point solution: because most groups are partnered to a
well-connected group and to few other groups, well-connected groups in centralized networks are visible across the network, and do not have to compete for their partners attention. Well-connected groups in centralized local networks can also direct the use of violence in other groups through their control of the flow of intelligence and resources, which could make the network more effective at coercion than less directed interconnected networks, whose groups may act in ways that are at odds with one another. They can also use their position to more effectively recruit and raise funds, which should increase their capacity and the capacity that they can pass on to their partners.

The benefits associated with a centralized system require that the well-connected groups invest in the capacity to maintain ties and process information. While this is costly, it also confers benefits on the specialized well-connected group. These specialized groups, as the integrators of information, receives broader information about which tactics are more likely to work when and where, and other contextual knowledge that cannot be gained at subordinate levels. This broad understanding should make the well-connected groups in centralized networks especially effective, because they will know when to use what tactics where, for greatest effect. It also gives well-connected groups in centralized networks leverage over subsidiary groups, since they depend on the well-connected groups for receipt of network benefits. Less-well connected partners accept their subservient position and confer benefits on their better-connected partners because it is safer (Bapat & Bond, 2012); and less costly than forming and maintaining more ties, and processing information themselves. Well-connected groups can also provide more poorly-connected groups sufficient network goods in order to entice them to stay. This means that well-connected groups can influence the activities that their partners engage in, in order to
achieve their goals even while limiting their direct engagement in the violence, as the moderate Peshawar parties did. Al Qaeda has not conducted a major attack since 2011, but has still wrought destruction toward their own ends by facilitating their partners.

A structural hypothesis is based on the following observations from the theory:

(1) Central groups in centralized communities specialize in information processing and distribution.

(2) Peripheral members in centralized communities dedicate fewer resources toward information processing and maintaining relationships than members of decentralized communities.

(3) Centralized structures facilitate collective action

*Hypothesis 2: Centralized communities facilitate greater capacity for attacks than decentralized networks.*

Centralized networks are resilient to the random removal of individual members, since there are many more poorly-connected groups than critical well-connected groups. They are not, however, resilient to targeted removal of members. Whether these networks are resilient to unraveling depends on how strong the best-connected groups are. Intelligence gained from a poorly-connected group reveals nothing about other poorly-connected groups, and because of the power dynamic between the well- and poorly-connected groups in centralized local networks, may reveal little critical information about the well-connected groups. If the well-connected group is compromised, however, all other groups in the network are imperiled.
The vulnerability of a centralized network differs from that of a decentralized network in an important way. In decentralized networks, unfiltered information passes throughout the entire network, meaning any member is a point of vulnerability. Neither strong, nor well-connected groups can filter this information because there are always redundant paths. In a centralized network, critical information is gated by well-connected groups. Innovations and intelligence can be transmitted to peripheral members without revealing information that would endanger other groups. If the well-connected members are strong and less subject to being compromised, then the network will be more resilient.

Along similar lines, decentralized networks are only as strong as their weakest members. Individual members cannot restrict membership or cut membership off. This means that decentralized networks are more vulnerable to unraveling. In centralized communities, on the other hand, specialized well-connected groups can vet potential partners. Al Qaeda, for example, is very careful who it allows into its network, carefully vetting potential affiliates. This leaves members freer to be more open, and to better realize the benefits of the network.

The following observations lead to the third hypothesis:

1. Well-connected groups in centralized networks specialize in vetting partners
2. Well-connected groups in centralized networks filter sensitive information to reduce the vulnerability of peripheral members
3. Decentralized networks are vulnerable to unraveling

*Hypothesis 3: Members of centralized communities are more long-lived than members of decentralized communities.*
2.2.7 Interaction Between Centralization and Structure

The discussion above suggests well-connected groups in centralized networks are unique because of the leverage they have from their structural power, and their specialization. First, the stability of the entire centralized local-network depends on the survival of well-connected groups. This means that centralized networks should only form around secure groups. Conversely, decentralized local networks are subject to unraveling. For example, information taken from a single operative from the Revolutionary Organization 17 November (17N) allowed to the entire organization being dismantled, which in turn led to lost information about 17N’s partners. Unlike in centralized local networks, in decentralized local networks there is no central coordinator to vet members of the network. Having more partnerships means more exposure, and greater vulnerability. We therefore expect the opposite effect in decentralized communities: well-connected groups should be more vulnerable in decentralized communities.

_Hypothesis 4: Well-connected groups in centralized communities survive longer, while well-connected groups in decentralized communities are more vulnerable._

Second, in centralized local networks, well-connected groups’ position gives them greater exposure to contextualized information, and allows them to dip into the flow of resources through the whole network. Their leverage also allows them to extract a disproportionate share of resources from their local network, which should give them greater capacity for violence and help them to survive. Well-connected groups in decentralized networks, on the other hand, do not have leverage because redundant ties mean that they are not critical to the network. Network members always have outside options. Unlike for the case of survival, however, while there are
likely decreased marginal returns to partnerships in decentralized communities, additional partnerships still benefit groups because they provide greater exposure to network flows. I therefore do not expect the effect of partnerships to be reversed.

Hypothesis 5: Well-connected groups in centralized communities have the highest capacity for violence

These hypotheses amount to observable implications of a core theory: centralized and decentralized network communities operate in different ways. While decentralized networks may be preferable to groups that prefer autonomy, the flow of network goods through centralized communities promotes greater capacity for violence, and greater security for their members. This is made possible by specialization of well-connected groups within centralized communities.

2.3 Research Design

2.3.1 Data

Network data were taken from the Big Allied and Dangerous 1 (BAAD1) dataset of militant group cooperative and rivalrous relationships (Asal & Rethemeyer, 2008b). These relationships were taken from the Terrorism Knowledge Base (TKB), compiled by the National Memorial Institute for the Prevention of Terrorism (MIPT). One limitation of the BAAD1 data is that they are static, representing whether groups ever had a relationship—a partnership, rivalry, or both—during the observation from 1998 to 2008 when the TKB stopped collecting data. While groups do shift their alliance patterns (Christia, 2012), but absent more detailed data on these dynamic shifts, these static data still provides a glimpse into the ways in which network incentives and structures shape behavior. Those relationships that the TKB listed as both cooperative and
rivalrous were excluded from the analysis. Only 18 out of 487 relationships in the data were reported as varying. Network data were not completely symmetrical. For the purpose of defining structure, I took the element-wise sum of the adjacency matrix, and its transpose, to infer an alliance wherever one group was listed for another as a partner, but not vice versa. I also use Horowitz & Potter’s (H&P) terrorist network data, also taken from the TKB in many robustness checks.

The labels in the network data did not match the groups in the TKB perfectly. After a merge attempt, the remaining groups were matched by hand. Groups that were the same group by different names were combined. For example, a series of groups called “al-Qaida” in the TKB were combined into al Qaida in Iraq, because all attacks were conducted in Iraq, and the spelling differed from TKB’s usual spelling of al Qaeda. A dictionary mapping is available in the supplementary material. Eleven groups were dropped from the BAAD data because they were unable to be matched.

Because the network data are static while the observations are dynamic, I adopted a strategy to reduce noise as much as possible. First, because my hypotheses focused on network effects, I excluded observations in which groups were not yet part of a network. Observations were excluded if fewer than 2 of a group’s community members had yet conducted attacks because I assumed the group was not yet in a network.

Local networks were calculated in two ways. For the primary analyses in the paper, a group’s local network extended out two degrees. In other words, each group’s local network consisted of their partners, and their partners’ partners. In robustness checks and figure generation, I used a Girvan Newman to identify communities based on modularity. A community is defined as a
subset of groups that are more connected to one another than to outsiders. I identified 439 communities in the network data, the majority of which were isolates and were excluded. I selected 439 because any more, and al Qaeda’s immediate network began to break apart. Any fewer, and major communities started to merge. Community membership is color coded in Figure 2.1 according to the Girvan Newman algorithm.

2.3.2 Dependent Variables

Capacity for Violence: The ability of groups to mobilize violence was captured using the number of attacks inflicted per month and the number of casualties inflicted per month. Groups with greater capacity for violence conduct attacks more often, and of greater intensity, than groups with lower capacity for violence. This captures a combination of group capability and desire to inflict violence. It captures capability because carrying out a sustained campaign of violence implies having the capacity to create or attain weapons, conduct an attack, and evade security forces. However, it is not a direct measure of capability, because it may be that groups are capable of carrying out more attacks than they choose to use. Furthermore, different terrorist groups have different goals. A group with more limited aims may be less violent than a group trying to destabilize a government, regardless of their relative capacities. However, capacity for violence among groups that choose to be violent should be enhanced or constrained by access to network goods. Number of attacks, and number of casualties were both taken from the TKB, though robustness checks were performed incorporating lethality information from the Global Terrorism Database (START, 2016).
To test hypotheses relating to groups’ capacity for violence, I used a hierarchical zero-inflated negative binomial regression. I used a Bayesian context in order to provide greater model flexibility. I used a zero-inflated negative binomial because the response variables—number of casualties and number of attacks—are over-dispersed\textsuperscript{ll} count variables with a disproportionate number of zeros. This method models two separate distributions: the probability of there being an attack in a given month, and the number of attacks/casualties in months where there are attacks. This model better accounts for the over-representation of zeros in the monthly data. Most groups do not conduct attacks every month.

I used a hierarchical model to account for observations over time. Controls and covariates were modeled at the group level. Every month, each active group took a draw from their own zero-inflated negative binomial distribution, with mean parameterized according to group level and network covariates. The model can be conceptualized as predicting each group’s probability of conducting an attack/probability of producing a certain number of casualties on any given month. For each group, time started at their first recorded attack in the TKB, so the time covariate can be thought of as the effect of age.

*Survival:* The TKB codes attacks from 1968 through 2008. I coded group death on the date of their final attack, if they did not conduct attacks for two years after their final recorded attack. Groups that conducted attacks in the final two years of the dataset were censored. Because the theory focuses on differences in network effects, I excluded groups that did not have partnerships in the BAAD1 network.

\textsuperscript{ll} The variance is different from the mean, implying that a Poisson regression is inappropriate.
Survival hypotheses were tested using a cox proportional hazard model with time-varying covariates. Network attributes varied over time based on group activity. For example, a group’s degree distribution might increase when a partner in BAAD1 conducts their first attack and becomes active, or decrease when a partner conducts their final recorded attack. Network covariates did not vary significantly over time.

2.3.3 EXPLANATORY VARIABLES: POSITION

Degree centrality: A group’s degree centrality is the number of partnerships held by that group. Within a centralized network, nodes with many more allies than others are hubs. Unlike other hierarchical structures, such as trees, hub-and-spoke networks are distinguished by their degree distributions, which makes degree centrality especially apt at identifying hubs. Degree centrality is less suited toward identifying influential nodes in interconnected networks because of the reducing marginal returns to ties, though having greater degree is correlated with having greater influence.

Because there are large outliers in degree, and because conceptually nodes with very high degree are structurally equivalent, I rescaling using the log of degree.

Eigenvector centrality: Eigenvector centrality measures a node’s influence on all other members of a network, and the extent to which a group is connected to other well connected groups. It is calculated by taking the eigenvector associated with the maximum eigenvalue of the adjacency matrix. Because eigenvector centrality is only meaningful on connected networks, I took the eigenvector of each connected component. This can be problematic because centrality
scores are not directly comparable across networks. For example, two groups in a dyad receive the maximum possible eigenvector centrality, despite the fact that they are much more isolated than most nodes in an interconnected network. To make the scores more comparable, I scaled them using the community’s maximum eigenvalue. In robustness checks in the supplementary material, I also standardize by community size. Figure 2.2 shows the terrorist network color-mapped to show each node’s eigenvector centrality, with dark red being the highest and dark blue being the lowest. See Appendix A for a discussion on the complications of eigenvector centrality, and how these complications have negatively impacted work in this domain in the past. As a robustness check, I also calculated groups’ local eigenvector centrality from their immediate communities, also scaling by the maximum eigenvalue.

I use degree centrality as my primary centrality measure for several reasons. First, the main downside to degree centrality is that there are reduced marginal gains to alliances as redundant ties are formed. However, the observed networks are sparse, so this is unlikely to be a concern in this analysis. Moreover, this concern is mitigated by log-transforming degree. Second, degree
centralities are more easily comparable across structures and components. Finally, because the primary focus of this paper is on the effect of community structure, and eigenvector centrality can conflate position and broader structure, degree centrality is a more appropriate measure. However, in order to compare the effect of structure to alternative hypotheses about eigenvector centrality, I include it in most analyses below.

**Hub:** Hub is an indicator variable of the *most* well-connected group within a network community. Hubs were calculated using degree centrality.

### 2.3.4 EXPLANATORY VARIABLES: CENTRALIZATION

I constructed a measure of the centralization of each group's local neighborhood for every month in time. This measure was adapted from Freeman (Freeman, Roeder, & Mulholland, 1979). Neighborhoods were measured as the centralization of a local neighborhood out to 2 degrees out from each group. This means a group’s local network included their partners, and their partners’ partners. $S_j$ is the centralization of the local-network surrounding group $j$. $C_D(p^*)$ is the degree centrality, or the number of partners, of the best-connected member of the neighborhood, and $C_D(p_i)$ is the degree centrality of each member of the neighborhood, $i$. As a robustness check, I also calculated centralization using degree centralities calculated including ties to groups outside of the local network. The denominator refers to the maximum possible sum of differences if the connections between nodes in the neighborhood were to be arranged into a hub-and-spoke network, with the hub being the group with the most connections outside the neighborhood (if there are any):
The degree centralization measure that only considered connections within the local-network is referred to as local-centralization, while the measure that considered connections outside the local-network is referred to here as embedded-centralization.

Degree centralization is measured as the sum of differences between the most connected node in the network, and the number of partners held by all other nodes, divided by the maximum sum of differences if the community were to be rescaled. In all cases, the maximum sum of differences would result in a hub-and-spoke network. This measure therefore represents the extent to which a network resembles a hub-and-spoke network. In order to capture tree-like centralized structures, I used eigenvector centralization in robustness checks.

Several measures can be used to capture a group’s position in the network, and the structure of that network. With half a dozen common measures of centrality, and an

\[
S_j = \frac{\sum_{i=1}^{N} C_D(p^*) - C_D(p_i)}{\max \sum_{i=1}^{N} C_D(p^*) - C_D(p_i)}
\]

**Figure 2.3. Local Network Centralization.** Centralization of modular communities in the cooperative network of violent actors. Color coded from blue (low centralization) to red (high centralization).
unlimited number of ways to conceptualize network topology, careful matching of theory to measure is necessary. I have described the theoretical rationale behind each choice, but it is still important to ensure that in the context of an observed network, that the measures correspond to theoretical expectations. Toward this end, two of the more abstract measures—eigenvector centrality and centralization—are color mapped onto the network in Figures 2.2 and 2.3.

2.3.5 Control Variables

I control for several theorized drivers of violence, primarily taken from A&R. There are so few terrorist communities that even if these drivers were randomly distributed, which is unlikely, there is likely to be imbalance which may cause bias without including controls.

Group Size: Controlling for size allows for comparison amongst more similar communities. If terrorists preferentially ally with stronger groups, or if having a large group requires a greater investment in coordination, then larger networks are likely to be more capable than smaller networks.

Community size: Controlling for community size also helps to more accurately compare between like communities of violent actors.

State sponsored: Having a common state sponsor may make groups more likely to cooperate, or it may free groups from the need to cooperate to mobilize resources. State sponsorship is also likely to increase a group’s capabilities and lethality.

Age: groups which have been around longer have had longer to develop allies, capacity, and a longer time in which to conduct attacks.
Religious, Ethnic: Certain ideologies may lend themselves both to specific alliance structures and to greater or lesser violence.

Territory: Terrorist groups which control territory are more attractive alliance partners because they can provide safe havens for their allies. They are also likely to be more capable, both because they were strong enough to attain territory, and because that territory facilitates their mobilization of resources and personnel.

Outliers: All models at the group level of analysis that include a measure of lethality exclude 9/11 because it is such an extreme outlier. Any model that can predict 9/11 explains the a large proportion of all casualties, which biases results. Note that I only exclude the outlying months, not al Qaeda as a whole.

2.4 Results

2.4.1 Capacity for Violence

Figure 2.4 shows the network color coded by group lethality. At first glance, well-connected groups in centralized local networks appear to be much more lethal than peripheral groups. To test the effects of position and structure on capacity for violence, I regressed measures of eigenvector centrality, degree centrality, and hubs (hypothesis 1), with centralization (hypothesis 2), on lethality and the number and of attacks and casualties per month, using the zero-inflated negative binomial regression described above. Results are reported in Figure 2.5. Similar figures with robustness checks are reported in Appendix B. Note that all regressions contained all controls, but only the effects for network covariates are shown. Three estimates are reported for each effect, each representing the estimate found by a different Markov Chain Monte Carlo
chain. The R-hat value is an indicator of convergence: if all three chains have similar behavior, then we are more confident that the model converged and that the estimates reflect the posterior distribution of the effects. R-hat values should be very close to 1, not greater than 1.2. Traces for all model variables are reported in Appendix B.

In each case, the coefficients for degree centrality and hubs are significant and positive. This means that on the whole, the best-connected groups conduct more attacks and more intense attacks with greater casualties. It is also worth noting that contrary to previous findings, controlling for centralization reduces the effect of eigenvector centrality.

The effect of centralization is also positive and significant. Groups in centralized local networks conduct more attacks that harm more people. This suggests that centralized networks are more efficient and are better able to mobilize resources to increase their members’ capacity for violence. This also shows that there is a positive additive relationship between being more well-connected and being in a centralized network. Well-connected groups in centralized networks conduct the most attacks, harming the most people.

![Figure 2.4. Group Lethality. Lethality of violent groups in the cooperative network of violent actors. Color coded from blue (low lethality) to red (high lethality).]
These findings are replicated using different measures of position (eigenvector centrality) and different measures of centralization (local degree centralization, eigenvector centralization). Results are presented in Appendix B, and show similar findings.

To determine whether the relationship between centralization and capacity for violence is driven by the capacity of well-connected groups, and to examine whether the relationship between centralization and being well-connected is multiplicative, I also examined an interaction between position and centralized structure. Results are presented in Figure 2.6. Robustness checks with alternative measures of centralization are presented in Appendix B and show similar results.

Depending on the specification, the interaction between connected groups and centralization is indistinguishable from zero, or small and negative. However, the sum of the simple main effects is much greater than the magnitude of the small negative interaction. This suggests that there may be slight diminishing returns to added partnerships among groups in centralized networks, and that the relationship between being well-connected and network structure is not multiplicative. However, it also demonstrates that the main effects presented in Figure 2.6 were not driven by very lethal very well-connected groups. Even poorly connected groups in centralized local networks produce more violence.

To summarize: Groups in centralized communities are more violent, and groups with more partners are more violent. The relationship between centralization and position is additive but not multiplicative: a well-connected group in a decentralized network is more violent than a less-well connected group in a decentralized network, but a well-connected group in a centralized network is even more violent. I now turn to the effects on capacity for survival.
Figure 2.5. Coefficient Estimates for Multi-Level Logit.
Each figure in the grid shows the coefficient estimates for a different model specification. The first column models casualties. The second column models the number of attacks. Each row represents a different measure of connectedness: number of connections while controlling for a weighted measure (eigenvector), number of connections, an indicator for whether the group has the most connections in its local-network, and the measure weighting influence of connections (eigenvector).
All models included the following controls, not shown: Organizational Size, Territorial Control, Sponsorship, Religious, Ethno-Nationalist, Age.
Three estimates for every coefficient are plotted with their 95% confidence intervals, and their standard errors in bold. Each estimate was taken from a separate MCMC simulation. The R-hat values indicate model convergence based on the similarity between each simulation. A value of 1 represents convergence.
Figure 2.6. Coefficient Estimates for Multi-Level Logit with Interactions.
Each figure in the grid shows the coefficient estimates for a different model specification. The first column models casualties. The second column models the number of attacks. Each row represents a different measure of connectedness: number of connections while controlling for a weighted measure (eigenvector), number of connections, an indicator for whether the group has the most connections in its local-network, and the measure weighting influence of connections (eigenvector).
All models included the following controls, not shown: Organizational Size, Territorial Control, Sponsorship, Religious, Ethno-Nationalist, Age.
Three estimates for every coefficient are plotted with their 95\% confidence intervals, and their standard errors in bold. Each estimate was taken from a separate MCMC simulation. The R-hat values indicate model convergence based on the similarity between each simulation. A value of 1 represents convergence. (cont.)
Figure 2.6. (cont.)
2.4.1 **Survival**

I hypothesized that groups in well-connected communities in general will be more long-lived because groups in decentralized communities were subject to unraveling strategies. I also hypothesized that there would be an interaction between number of partners, and centralization: in decentralized communities, unraveling leaves more-connected partners more vulnerable, while in centralized communities, well-connected groups help to provide security and thus can only form around secure groups. I test these hypotheses with a Cox Proportional Hazard model, presented in Table 2.1 and 2.2. Cox Proportional Hazard models calculate the instantaneous hazard of a group ending given its network position and structure. Negative coefficients mean groups survive longer. The exponent of a coefficient represents the proportional change in the baseline hazard of death with a one unit change in the covariate.

Main effects show that groups in centralized communities are statistically and substantively significantly less likely to end in a given

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Coefficient</th>
<th>exp(coef)</th>
<th>p-val</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree</td>
<td>-1.00 (.311)</td>
<td>.367</td>
<td>.001</td>
</tr>
<tr>
<td>Centralization</td>
<td>-1.249 (.412)</td>
<td>.287</td>
<td>.002</td>
</tr>
<tr>
<td>Eigenvector</td>
<td>.073 (282)</td>
<td>1.075</td>
<td>.797</td>
</tr>
<tr>
<td>Size</td>
<td>.031 (.018)</td>
<td>1.032</td>
<td>.086</td>
</tr>
<tr>
<td>Territory</td>
<td>-.075 (.309)</td>
<td>.928</td>
<td>.808</td>
</tr>
<tr>
<td>Sponsored</td>
<td>-.941 (.341)</td>
<td>.390</td>
<td>.006</td>
</tr>
<tr>
<td>Ethno-National</td>
<td>-.803 (222)</td>
<td>.448</td>
<td>.0003</td>
</tr>
<tr>
<td>Org Size</td>
<td>-6.323e-4 (6.65e-4)</td>
<td>.999</td>
<td>.342</td>
</tr>
<tr>
<td>Religious</td>
<td>-.023 (.284)</td>
<td>.977</td>
<td>.9343</td>
</tr>
</tbody>
</table>

Likelihood ratio test = 54.9 on 9f, p=1.29*10-8
n=721, number of events = 124
month. When controlling for centralization, there is also a negative effect of partnerships: groups with more partners are less likely to die in a given month.

Interaction effects are shown in Table 2.2. To ease interpretation, I used the reverse of centralization, in which 1 represents the least centralized network, while 0 represents the most centralized network. This means that simple main effects coefficient for hub (an indicator for the most connected group in a local network) represents the effect of being the most connected group in a centralized network. I also centered the hub indicator from -.5 to .5.

The simple main effect for hub is significant and negative, meaning that the most well-connected group in a centralized network is less likely to die in a given month: such a group has an instantaneous hazard of death of .245 that of a poorly connected group in a centralized network.

Table 2.2. Cox Proportional Hazard with Interaction.
Regression coefficients for a cox proportional hazard model, with their exponent. Negative coefficients mean lower probability of ending in a given month, while the exponent indicates by how much. Multiplying the exponential terms in the interaction, the best-connected groups in decentralized networks have an instantaneous hazard of death 3.717 times higher than baseline, while the best-connected groups in centralized networks have an instantaneous hazard of death of only .245 times baseline.

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Coefficient</th>
<th>exp(coef)</th>
<th>p-val</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hub</td>
<td>-1.408 (.605)</td>
<td>.245</td>
<td>.019</td>
</tr>
<tr>
<td>Reverse Centralization</td>
<td>.884 (.441)</td>
<td>2.422</td>
<td>.045</td>
</tr>
<tr>
<td>Hub* Reverse Centralization</td>
<td>1.837 (.902)</td>
<td>6.278</td>
<td>.042</td>
</tr>
<tr>
<td>Size</td>
<td>-7.87e-4 (6.90e-4)</td>
<td>.988</td>
<td>.254</td>
</tr>
<tr>
<td>Territory</td>
<td>-.082 (.315)</td>
<td>.920</td>
<td>.794</td>
</tr>
<tr>
<td>Sponsored</td>
<td>-.911 (.337)</td>
<td>.402</td>
<td>.007</td>
</tr>
<tr>
<td>Ethno-National</td>
<td>-.817 (.229)</td>
<td>.442</td>
<td>.0004</td>
</tr>
<tr>
<td>Org Size</td>
<td>-7.87e-4 (6.90e-4)</td>
<td>.999</td>
<td>.254</td>
</tr>
<tr>
<td>Religious</td>
<td>-.054 (.281)</td>
<td>.947</td>
<td>.847</td>
</tr>
</tbody>
</table>

Likelihood ratio test=47.1 on 9 df, p=3.71e-07 n= 721, number of events= 124
network. Moreover, both the interaction and the simple main effect for reversed centralization are positive. The best-connected group in a decentralized network has an instantaneous hazard of death of 3.717 times greater than the baseline hazard. This provides evidence in support of hypothesis 5.

2.5 Conclusion

The findings are summarized in Table 2.3. I find strong evidence in support of the idea that network structure is a predictor of group behavior and operational outcomes. Most notably, I find that the effect of group partnerships described by previous work is actually mediated by local network structure (Asal & Rethemeyer, 2008b; Horowitz & Potter, 2013; Phillips, 2013). Well-connected groups in centralized—but not decentralized—local networks are more long-lived. Well-connected groups in centralized local-networks are more lethal than well-connected groups in decentralized networks. Moreover, even poorly-connected groups in centralized networks have greater capacity for violence and survival. These results suggest that future work should consider both inter-group interdependence, and structural effects when theorizing about group-level outcomes.

As with many network studies, it is difficult to distinguish between the effects of network evolution and the effects of network structure on behavior. The two represent an interconnected endogenous process that cannot be separated without robust temporal data, if at all (Shalizi & Thomas, 2011a). Since illicit groups are secretive by nature, it may never be possible to fully distinguish between these effects. The theory presented here suggests that both are occurring: well-connected groups in centralized local networks are selected into their position because of
their strength and stability, and their structural leverage in turn helps them to remain powerful and secure. From the data available, we may never know if one of the processes is dominant. However, we can say with confidence that the structure of partnerships in which a group is embedded, and its position within that web, has important implications for important group outcomes.

These findings have important implications for security strategy. Recognizing the coordinating function of well-connected groups in centralized networks, and how this differs from well-connected groups in decentralized local networks, implies that different disruption strategies should be used against prominent groups in different contexts. Centralized communities present a catch-22 for law enforcement: they are the most dangerous, and the most difficult to disrupt. When targeting a centralized local network, intensifying the threat environment of groups may backfire, making them feel more dependent on and closer to the well-connected groups at the center, thereby increasing their capacity for collective action. With some groups, such as al Qaeda and its network, this may be a worthwhile risk. However, a more effective accompanying strategy would be to discredit the coordinators at the center of these centralized networks. Law enforcement can disrupt trust in these networks by focusing on infiltrating, (or claiming to have infiltrated,) the most well-connected groups in these networks, thereby reducing confidence in their capacity to protect their partner’s security. Governments might also use information campaigns to emphasize the ways in which well-connected groups take advantage of their less-connected partners. This should weaken the local network as a whole by reducing the flow of network goods.
The findings have the opposite implication for decentralized local networks. While the vulnerability findings suggest that there is less marginal utility to targeting peripheral groups in a centralized local network, it can be an effective strategy in decentralized local network. Because they are less able to filter their members, law enforcement can target the weakest actors in order to learn more about their partners. Moreover, increasing the threat environment decreases trust, because members are more likely to be able to harm one another by defecting (Bapat & Bond, 2012). This means that groups can more easily be played off one another. Understanding the context within which groups exist will help us to better learn how to fight them.

<table>
<thead>
<tr>
<th>Table 2.3. Summary of Findings.</th>
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</thead>
<tbody>
<tr>
<td><strong>Capacity for Violence</strong></td>
</tr>
<tr>
<td><strong>H1:</strong> Better-connected groups have greater capacity for violence</td>
</tr>
<tr>
<td><strong>H2:</strong> Centralized networks have greater capacity for violence than decentralized networks.</td>
</tr>
<tr>
<td><strong>H4:</strong> Well-connected groups in centralized networks have the highest capacity for violence</td>
</tr>
<tr>
<td><strong>Longevity</strong></td>
</tr>
<tr>
<td><strong>H3:</strong> Groups in centralized communities survive longer.</td>
</tr>
<tr>
<td><strong>H5:</strong> Well-connected groups in centralized communities survive longer, while well-connected groups in decentralized communities are more vulnerable.</td>
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</tbody>
</table>
CHAPTER III
DEVS IN THE DETAILS: LEARNING AND DIFFUSION IN NETWORKS OF VIOLENT GROUPS

3.1 INTRODUCTION

Violent non-state actors need to adapt in order to survive. Because security forces actively try to stop violent groups, they must innovate to continue to be effective, continue to attract attention, and continue to evade capture. How do violent actors learn their craft? Do they innovate on their own, or by observing others? Or do they tend to rely on direct training from partners and more experienced fighters? When and why would violent actors rely on either strategy? Understanding the answer to this question is critical for predicting what violent groups will do next, and finding ways to stop them.

Despite the need to adapt, adapting is also costly. Adopting new tactics is risky, both for groups’ reputation if it fails and because failed attacks can put operatives at risk. Under what conditions are violent organizations more likely to take the initiative to learn new tactics? The answer to this question sheds light on the first: learning from one another can help reduce the costs of adopting a new tactic. Moreover, because groups have an interest in protecting their tactical information, learning by observing indirectly is less productive. In this paper I provide evidence that on the whole, violent tactics do diffuse through formalized partnerships directly, which suggests that the groups do indeed learn from one another.

Before a group adopts a new tactic, there must both be a desire to adopt, and the capacity to adopt. On the capacity side, I argue that groups are more able to learn a tactic when they have a partner that has recently used it. Moreover, the structure of partnerships shapes a group’s propensity to adopt. This has cross-cutting effects. Among flat local networks, in which groups
have on average a similar number of partners, there are negative marginal returns to adding partners: groups can learn as long as they have at least one partner that uses a tactic. Moreover, well-connected groups can adopt tactics from any of their neighbors, while poorly connected groups are more dependent on their partners have fewer options and are more dependent on those options for access to the network. While this trend holds in flatter local networks, the opposite is true in centralized networks in which one or few groups have more partners than the rest. These well-connected, or central, groups have greater structural power because they can threaten to cut their partners off from the rest of the network. They also specialize in their role, developing organizational capacity to learn. There are positive returns to new partnerships in centralized local networks. Finally, competition increases the tension between capacity and desire: groups want to adopt new tactics to compete, but are in a riskier security environment. Rivalries make groups more likely to adopt tactics, especially when they have partners who employ those tactics.

By elucidating the processes underlying the diffusion of violent tactics, this work makes five major contributions. First, it is the first comprehensive look at the diffusion of violent innovations along cooperative non-state networks. It asks the question: do direct partnerships matter for the spread of violence, or can groups learn from one another without direct interaction? Second, it goes a step further, asking how the entire structure of partnerships and the distribution of structural power among violent actors shapes the diffusion of violent tactics. Not all groups in a network are equal, and as a result, diffusion is not uniform. Third, it directly examines the role of competition in driving violent innovation, asking whether competition among violent actors can lead to tactical arms races. Fourth, it disaggregates the adoption of violence into different tactics, giving a more nuanced picture of violent diffusion. Finally, it
illustrates a new method to control for interdependencies among violent actors. Traditional statistical methods fail to account for the lack of independence between observations. Moreover, illicit organizations are secretive by nature, leading to severe data constraints. Using a multi-level adaptation of a temporal network autocorrelation model, I am able to account for group differences as well as interdependencies.

Understanding the diffusion of tactics is critical for policy makers and security agencies. States try to protect against attacks by hardening potential targets, but hardening often requires up front investments and anticipation of what targets are at risk, how. Similarly, the ability of law enforcement to investigate potential attacks and prevent them depends on understanding what violent organizations are going to do. Law enforcement and security organizations should look not only at what a group has done in the past, but what its closest allies do, as well as the structure of the cooperative and competitive environment in which the group exists. Understanding the context of a group’s relationships will help law enforcement to predict whether and which tactics groups will adopt in the future.

There are endogeneity concerns in any observational study, and they often come to the surface in network analyses. In this paper I observe diffusion of violent tactics across partnerships, but are groups learning from one another, or is it that groups with similar operating constraints are both more likely to adopt certain tactics and more likely to partner? While it may never be possible to fully disaggregate between these two possibilities (Shalizi & Thomas, 2011b), I address this by providing illustrative vignettes throughout the paper, describing instances of groups seeking out knowledge from their partners, which improves the causal plausibility of the story. There are countless examples of groups with similar goals in similar
circumstances adopting different tactical profiles. I also control for various group-level predictors that are predicted to be associated with different tactical decisions. Finally, I find that groups are less likely to adopt those tactics that are adopted by their rivals, suggesting that situational considerations are not driving adoption. Altogether, this improves our confidence in the learning mechanism described here.

I will begin by framing the puzzle and the context with examples of violent actor learning. This is followed by a brief review of the literature on contagion of violence, learning, and choice of tactics among non-state actors. I will then describe my theory and lay out my core hypotheses, as well as alternative explanations drawn from the literature. Next I will describe my empirical strategy and data. The following section reports my results. Finally, I will conclude with implications for the field and policy makers, and a series of open questions to motivate future research.

3.2 LEARNING AMONG VIOLENT ACTORS

When Tamerlan Tsarnaev wanted to become a Jihadi, he tried to go to Chechnya to become a rebel fighter, but was turned away. He returned to the US and, with the help of his brother, built and detonated a bomb at the Boston Marathon. If the Caucasus Emirates turned him away, how did learn how to build a bomb?

The Tsarnev brothers based their design on instructions found in an English language al Qaeda magazine called *Inspire*. The article, titled How to Make a Bomb in your Mother’s Kitchen, was also used by Jose Pimental in the bombs he built in order to attack returning

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military servicemen, post offices, and the police in New York. Naser Jason Abdo had a copy of the article along with the components necessary to build a bomb before he could attack a restaurant frequented by military servicemen in Fort Hood. In all of these cases, individuals learned how to carry out attacks without direct support from the violent organization who had shared the information.

The Inspire article is not unique. The Islamic State in Iraq and the Levant (ISIL) has published videos with similar instructions, to similar results. Inspire publishes articles assessing recent attacks and offering critiques so that future attackers can do better (Reaves, 2016). In a magazine called Rumihah, ISIL has provided instructions for vehicular attacks such as the one seen in Nice, the German Christmas Market, and The Ohio State University. These publications, and the attacks that follow them, are examples of violent organizations sharing tactical information with non-members. These publications are a mechanism by which violent tactics can diffuse indirectly.

At the same time, there are many examples of groups going out of their way to cooperate with one another directly in order to take advantage of one another's expertise through a process of direct violent diffusion. This suggests that reading an article often is not enough. Groups partner with one another in order to learn both technical skills such as bomb making, as well as how to successfully employ tactics such as suicide terror within a broader campaign. Hamas sought help from Hezbollah on how to conduct effective suicide campaigns. Al Qaeda has sought training from Hezbollah because Hezbollah had demonstrated mastery of bombing hard

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**Footnotes**

- † (“Al Qaeda Inspired New York Resident Arrested on Terrorism Charges,” 2011)
- ‡ (“Inspire Magazine,” 2013)
- †† (Knapp, 2017)
targets, even though the two groups were not ideologically aligned (Horowitz, 2010). Similarly, the Japanese Red Army went to Palestine to train with the Popular Front for the Liberation of Palestine (PFLP). The PFLP agreed to train the Japanese Red Army in exchange for a series of attacks against PFLP targets. The Provisional Irish Republican Army (PIRA) made a deal with the Revolutionary Armed Forces of Colombia (FARC) in which they traded expertise on making car bombs for weapons.

Individuals also make an effort to learn from successful organizations in order to bring experience back to their own conflicts. In the buildup to the Chechen civil war, fighters left Chechnya to get experience in neighboring civil wars including Afghanistan and Abkhazia. A prominent example is Shamil Basayev, who took half his battalion with him to join the Abkhazian fight, and used that experience to train his own units in Chechnya and to rise as a leader. Al Qaeda expends resources to facilitate this strategy by formally training operatives for partner organizations in its training camps, and by sending formal trainers and advisors to its partners. For example, al Qaeda embedded an operative named Mohammed Fazel to monitor al Shabaab and act as a trainer and advisor (Mendelsohn, 2016). Inspire is cheap by comparison, but al Qaeda still invests in trainers.

Why would these individuals go to such lengths if learning didn’t require more than reading how-to manuals? Why would groups expend resources and forge risky partnerships with other violent groups if they could adopt on their own? These competing narratives represent tensions in group incentives to learn and adopt new tactics. In order to shed light on this question, we turn to a brief review of the literature on the diffusion of violence.

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91 (Billingsley, 1999; “Casus belli for the Caucasus,” 1999)
3.3 LITERATURE REVIEW

3.3.1 CONTAGION OF VIOLENCE

The sub-state violence contagion literature has largely focused on the spread of violence at the level of the state (Buhaug & Gleditsch, 2006). Beginning with the discussion of domino theory and the spread of leftist insurgency, (Jervis & Snyder, 1991; Macdonald, 1993) and extending to more nuanced work today (Danneman & Ritter, 2014), the conclusion seems to be that yes: violence is contagious. Some of the mechanisms identified are informative in exploring the role of direct diffusion of violence, and might be extended to understand the spread of different forms of violence across state lines.

One way that conflict spreads is by providing information that changes groups' rational calculation about the returns to conflict. This can occur through demonstration effects (Kuran, 1991, 1998; Midlarsky, Crenshaw, & Yoshida, 1980), or because it reveals information about the cost of protest or security of an ethnic group (Lake & Rothchild, 1996), or because it reveals information about the returns to conflict (Linebarger, 2016; Walter, 2009). Demonstration effects are analogous to the indirect learning narrative. However, these explanations are centered primarily toward the decision to engage in violent conflict at all, rather than on the nature of conflict spread. Seeing another group successfully employ violence, or even specific violent tactics, may make other groups want to adopt them, but tactical diffusion requires learning specific skills which may be less amenable to spreading through observation.

Another mechanism relates to the movement of refugees across borders (Beardsley, 2011; Salehyan & Gleditsch, 2006). Indirectly, refugees can create competitive pressures in other states
leading to the creation of conflict. More directly, and relevantly, they can contribute to conflict by expanding the social network of violent actors. This hints at the mechanisms tested here: expanding social networks implies that violent actors can help one another directly.

Flows of people can also facilitate the direct movement of violent actors and weapons across borders. The expulsion of fighters from one state can push them into another, where their training and expertise can be used in conflict (Black, 2013; Hegghammer, 2013). For example, it was the physical movement of fighters from Libya that contributed to the most recent Tuareg rebellion. Fighters can also cross borders in search of safe havens of plunder (Beardsley, 2011; Brown, 1996).

The root flow of people mechanisms can be expanded more broadly. Contagion occurs because people often happen to move nearby. But one key mechanism is exposure and access to experience and arms. When it comes to the onset of a civil war, proximity may be a good proxy for flows significant enough to help new violent groups emerge as major contenders in new states. However, at a smaller scale, such as the diffusion of individual tactics, exposure and access likely facilitate learning beyond contiguous borders.

Finally, contagion is also attributed to external support, often of ethnic groups (Black, 2013; Gleditsch, 2007), or successful revolutionary movements (Black, 2013; Linebarger, 2016). This mechanism can also be applied at the group level beyond contiguous states, as individual groups support one another.

While the contagion literature hints at diffusion among groups, two things are missing. First, it has primarily focused on physical proximity. But if diffusion of violence takes place in part because of the movement of individuals and weapons, then it follows that violence should
diffuse wherever violent actors move and interact, whether they are on the border or in the physical neighborhood, or not.

3.3.2 Learning and Violent Groups

The literature on violent group learning takes a step toward resolving the hole in the contagion literature, but is more limited in scope. Horowitz (2010) argues that organizational constraints determine which groups are more likely to innovate or adopt a new technique. He argues that old, more established groups are more set in their ways and thus have more difficulty innovating than new groups. He tests this theory in the context of suicide terror, and finds that young groups are more able to learn than older groups.

Both Horowitz and Acosta & Childes (Acosta & Childs, 2013) look at the diffusion of suicide terror among groups. Both suggest that direct diffusion is likely happening, and trace the adoption of suicide terror across groups, creating a network of groups that did adopt in the process. Horowitz’ test of direct diffusion across groups, however, is with a measure of whether they are aligned with al Qaeda. Acosta & Childes are primarily focused on understanding structures within the diffusion network and how they affect the number of attacks. While these two studies suggest a link between cooperative partnerships and learning in the domain of suicide terror, neither provides a definitive or general test.

A final possibility is that groups learn when they are under greater competition (Horowitz, Perkoski, & Potter, 2015). ISIS and al Qaeda to try to one-up one another (Watts, 2016). Groups engage in outbidding, and use suicide tactics in part in that pursuit (Bloom, 2005). These studies
are all suggestive, but no study to date has looked generally at the effect of rivals on adoption of tactics.

3.3.3 Tactical Choice

Critical to understanding why groups choose to adopt a tactic is the question of how groups select among tactics. Most studies assume that violent groups have collective rationality and behave strategically (McCormick, 2003). As such, groups are presumed to select the tactics that are most appropriate for their needs. Pape describes the symbolic importance of suicide terror, and suggests this makes it effective in nationalist self-determination contexts (Pape, 2003). Bloom adds generality and nuance, describing more broadly the contexts in which suicide terror is most effective (Bloom, 2005). It is effective when groups are engaged in outbidding, when governments crack down, and when it is endorsed by the community supporting the violent actor.

These theories, in combination with work on the pressures of competition, implies an argument for the desire side of tactical diffusion, but not their capacity to learn.

On the capacity side, Berman and Laitin assert that suicide terror can be more effective, and describe the conditions under which groups are capable of eliciting sufficient dedication from their members to achieve it (Berman & Laitin, 2008). Groups that demand sacrifice from members can both screen out undedicated members and incentivize participation by producing club goods, making these organizations more capable overall. They do not, however, address how groups learn new tactics.
Bakke (2013) is a notable exception to the strategic logic argument. She describes the social construction of the appropriateness of attacks, and how groups can engage in emulation, adopting tactics because they are supposed to, and in order to signal conformity in a social system. This is compatible with my current approach. In order for learning to occur, groups only need to believe they are selecting the best tactic for the job. Moreover, this paper looks at the diffusion of tactics across a social network. Diffusion is facilitated if groups are selecting tactics based on what their partners believe are most effective.

On the whole, the literature focuses either generally on the onset of violence or terrorism, or on narrow tactics, rather than on diffusion and learning writ large. Moreover, diffusion has been studied either through geographical proximity, or with very course measures. The only two studies addressing diffusion of violent innovations focused on suicide terror, and neither used a complete network to explore how learning might take place across an extant network of relationships.

3.4 Theory

3.4.1 Desire vs Capacity

In order for a group to adopt a violent tactic, two conditions must be met. First is a desire condition: the group must want to use the tactic. Second is a capacity condition: the group must be capable of employing the tactic. A capable group that knows how but chooses not to use a certain tactic does not adopt that tactic because of lack of demand. For example, following Kalyvas (2006), a group that chooses not to use indiscriminate violence in territory where it has strong control has a lack of demand for a strategy that employs indiscriminate violence.
Conversely, a group that would like to employ a given tactic but cannot because they do not
know how or are unable, fails to adopt the strategy because of a failure of capacity: the group
does not have access to the knowledge or materiel necessary to conduct attacks of a type.
Continuing with the Kalyvas example, a group that is weaker in a given territory may wish that it
could employ targeted assassinations, but be unable to do so because it does not have the
necessary information or capacity.

My theoretical argument will develop as follows. I will begin by establishing that although
various factors increase or decrease desire for new tactics, groups are generally interested in
developing new tactics. I then argue that desire can be shaped by the social network within
which a group is embedded, suggesting that demand among groups is interdependent. I then
move on to a discussion of how capacity constraints make adoption risky, but how partnerships
can reduce the risks associated with adopting new tactics, thereby leading to a greater rate of
adoption. Moreover, structures within a network further shape both demand and supply.

3.4.2 Desire

Violent groups exist in asymmetric, conflictual security environments. By definition, these
groups are illicit, and thus face existential threats from security forces. In the same way that
anarchy and existential threats drive states to create and modernize their military, violent actors
must evolve in order to survive. If groups are unable to learn, then they become increasingly
vulnerable and less capable of carrying out attacks. This occurs because as security forces learn
the behavioral patterns of groups, they become better at preventative investigations and
countering attacks.
For example, militant groups used common materials to build explosive. In response, governments began tracking purchases of those materials. When large quantities of the right combination of materials were purchased, law enforcement could investigate. This made it easier to track down would-be attackers before attacks took place. Groups needed to adapt their tactics in order to continue to be operationally effective, and in order to protect their operatives from detection.

A second example is the evolution of improvised explosive devices (IEDs) during the wars in Iraq and Afghanistan. The US military developed technologies and operating procedures that minimized the effect of early improvised explosive devices. As the US military adapted, so did insurgents. Early IEDs were triggered with a wire or pressure plate. As military units became better at recognizing them, insurgents adapted and created IEDs that detonated remotely using radio waves. When the military started using jamming, IEDs got timers. In parallel, as the military adjusted its patrolling and transportation configurations, insurgents adjusted the pattern of placement of IEDs.

A third example comes from drug cartels. As border patrols were strengthened along the US-Mexico border, groups needed to find alternative paths of entry. One method they used was to build rudimentary submarines that could be used to sneak drugs onto the California coast. Because security forces evolve, illicit groups that fail to evolve will lose their capability to inflict damage and be vulnerable to law enforcement and security forces. While not every tactical innovation will be appropriate for every context, groups still must learn in order to thwart security forces, and to compete amongst themselves. Groups must adapt to survive.

(Murphy, 2017; Zanetti, n.d.)
While survival is a primary concern for groups, the logic of appropriateness also shapes the choices that groups make (Checkel, 2013). Personal exposure between individuals from different militant groups helps shape this logic (Bakke, 2013). Groups learn from one another's successes and failures (Linebarger, 2016), but interpretation of those successes and failures is shaped by social context. This is especially important if terrorist tactics do not usually lead to realization of political objectives: perception that a set of tactics is effective is likely more important than whether or not the tactic actually is effective (Abrahms, 2006, 2011; Fortna, 2015). This means that groups that have cooperative partnerships are more likely to want to adopt those tactics that their partners have adapted.

3.4.3 Capacity

Groups use on average between 5 and 6 different types of tactic, as categorized by the Global Terrorism Database’s descriptors. If evolution is so critical to group survival, why do groups use so few? While individual preferences likely contribute, the answer is that pressures to adapt are met with constraints preventing group adaptation. Groups have finite resources to dedicate toward learning and training their operatives in new techniques. Experimentation costs time and resources. Al Qaeda dedicated a camp and considerable resources toward researching chemical weapons, but never succeeded (bin Laden, bin Laden, & Sasson, 2010). Most groups do not have al Qaeda’s level of resources to experiment. Moreover, because groups operate as illicit organizations, trial and error can be fatal for three reasons.

First, as Bloom suggested in the case of suicide terror, certain tactics are better or less well received by groups' support base (Bloom, 2005). Encasing attacks in an effective campaign,
complete with effective messaging, is critical to success. However, groups often do not know ahead of time what frames are most effective, or what tactics are likely to alienate their populations. Maskadov was exasperated when commanders within the Ischerian Republic adopted hostage-taking into their repertoire because it alienated certain elements of his broader support base. Likewise, Osama bin Laden was frustrated by al Qaeda in Iraq’s use of beheadings for similar reasons. Al Qaeda in Iraq ignored bin Laden’s advice and used brutal tactics with impunity because they thought their reign of terror was effective, until it backfired among the Sunni population and led to massive losses during the Anbar Awakening (Biddle, Friedman, & Shapiro, 2012; Mendelsohn, 2016). Likewise, the Algerian Islamic Groups (GIA) adopted brutal tactics after an inexperienced leader, a literal butcher, unexpectedly took power. The GIA’s shift in tactics and operations backfired (Tawil, 2011). Groups must frame any new tactics in the context of campaigns that further their aims, and doing so takes time and effort. That was part of the reason Hamas needed training from Hezbollah, who had engaged in successful suicide campaigns. Getting it wrong can have negative consequences for the reputation of violent actors.

Second, adopting new tactics can be risky because if executed poorly, the group could look weak for conducting failed attacks. Violent actors often use violence in order to signal that they have the capacity to impose costs, and to gain support (Kydd & Walter, 2006). Conducting failed attacks because they were poorly executed signals the opposite, making a group risk looking incompetent if they attempt to employ a tactic before they have mastered it. For example, the Underwear Bomber’s failed attempt to innovate for al Qaeda became an embarrassing failure.

Finally adopting new techniques is risky because it involves risking valuable operatives. If members of the group attempt to plan an attack for which they are ill prepared, they risk being
caught by law enforcement, as occurred with the Red Army Faction’s early attempts at
kidnapping. When producing explosives, an inexperienced group might not know how to cover
their tracks when purchasing raw ingredients, making them more susceptible to capture.
Inexperienced operatives may not know how to handle a hostage negotiation, thereby risking
their lives. In addition to the loss of the operatives themselves, captured operatives have
information about militant groups that can help law enforcement to harm the organization as a
whole.

For all of these reasons, if groups take the time to invest in a new tactic, they must take the
time to do it right. So under what conditions is adopting a new tactic worth the risk, and how do
groups go about learning?

Partners can help alleviate all of these tensions. When a group learns a tactic through
exposure to an experienced partner, it does not have to pay the cost of experimentation. While
new operatives must still dedicate time and resources to training in the new tactic, they do not
have to engage in the trial and error involved in learning a new tactic by themselves. For
example, even with the Inspire article on bomb making, without experienced assistance the
Tamerlan brothers had to experiment with bomb making to produce the bombs used in the
Boston Marathon attacks, all the while risking exposure. When operatives go to an al Qaeda
training camp, on the other hand, they attend a whole class on bomb making and explosives use.

Learning a tactic from a partner helps groups to mitigate the risks from a trial and error
period as groups learn, often because they can practice in a safe environment. For example,
Chechen rebels managed to mitigate their trial period by sending fighters to other groups to train
in anticipation of their civil war. Many of the major commanders in the Chechen civil war gained
experience outside of Chechnya before rising through the ranks. While Shamil Baseyev was still a minor commander, he went to Abkhazia to train in the war there. Basayev took many of his fighters with him when he went, and described a formal strategy of using those fighters to train others in order to create an effective unit. Ibn al Khattab, who ran the foreign fighter unit, had experience in the Afghan civil war, and attended Afghan training camps. This external training helped the fighters in Chechnya to hit the ground running when the civil war began in earnest.

The Red Army Faction in Japan provides an example of a group for whom a trial and error period for the adoption of hijackings and kidnappings was disastrous. They grew out of a protest movement in Japan as a violent organization, but without members experienced in violent resistance. After their first failed attack, at least fifty of their members were arrested. They then attempted to copy global trends in terrorism at the time with an aircraft hijacking. But the attempt failed because they selected a plane that was too small to fly them to their requested destination. They were then tricked into landing in Seoul instead of North Korea, and when they finally did make it to North Korea, the attackers were subject to a decades’ imprisonment where several members eventually died. The attack was a resounding failure. The group was unable to emulate the attacks it observed, and after a series of failures, regrouped as the Japanese Red Army and sought the support of the PFLP, from whom they could receive formal training in violent tactics. The training helped the group to conduct several successful attacks.

Groups can learn the ins and outs and keys to success that only come with experience if they learn from observing a partner who shares insights into their experience. When FARC wanted to expand into urban warfare, it reached out to PIRA in order to learn how to make and deploy

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88 Interview with Baseyev in 1999. Transcript printed in full by Jane’s Intelligence Review. (“Casus belli for the Caucasus,” 1999)
mortar explosives. Small details like how to effectively create an IED or place a bomb come from experience and involve technical skill. They can mean the difference between the success and failure. Recognizing this, FARC reached out to PIRA so they could do it right, before risking a failed campaign. Al Qaeda followed a similar rationale when reaching out to Hezbollah, despite their ideological differences. Bin Laden decided that al Qaeda needed to conduct a successful attack against a hard target for strategic reasons (desire), but also decided that it did not yet have the expertise necessary (capacity). Recognized the difficulty of conducting a successful campaign against a hard target, he sent operatives to learn from Hezbollah, which he considered to be an expert after their successful attack of the U.S. Marine Corps barracks in Lebanon (Horowitz, 2010).

The examples above show that groups can learn from one another, but are there alternatives? Independent innovation can and does occur: if it did not, new tactics would never emerge. PIRA innovated in explosives making. Hezbollah innovated in successful suicide campaigns. Al Qaeda attempted to innovate in the creation of chemical weapons. But innovating without support is also costly, and limited to well-resourced groups. Invention requires an investment of resources with uncertain return, and a space in which to operate. For example, al Qaeda’s chemical weapons experimentation facility was hidden safely in Afghanistan. Al Qaeda is constantly probing for new vulnerabilities, as it did with the Underwear Bomber and the Shoe Bomber. But these probes are risky.

Another alternative would be if groups could learn from one another indirectly through online or print publications. Inspire attempts to provide lessons learned through its Inspire magazine by critiquing recent attacks, for example. Even bin Laden is known to have studied
Maoist doctrine and scholarly literature on insurgency. But as his actions with Hezbollah suggest, he did not believe book learning was enough to provide the tactical skill to launch a successful attack. There are two reasons why groups are unlikely to be able to learn enough non-direct sources like Inspire.

First, experienced groups are unlikely to provide all the tactical information necessary for an effective campaign in open or easily compromised sources. As soon as a group publicizes its techniques, those techniques risk becoming less effective. Anything Inspire publishes about avoiding law enforcement is also read by law enforcement, making it less effective and making groups that follow the advice more predictable. The more detail they provide, the more security forces learn about their operational procedures and the patterns of behavior that might help investigators to prevent or harden against an attack. Inspire and Dabiq serve al Qaeda’s and ISIL’s broader aims in that that they encourage lone wolf attacks, but do not provide advanced tactical information, or information on how to fold an attack into a campaign. As evidence, most of the lone wolves we hear about were failures. This suits ISIL and al Qaeda just fine: they can disown any failed attacks while pointing to them as evidence of global malcontent. They do not need lone wolves to succeed most of the time. Groups, on the other hand, need their operatives to succeed. The information provided in Dabiq and Inspire is not as helpful to them.

Dabiq and Inspire provide basic information on basic attacks. This information is limited enough not to hurt the home organizations. Groups have an interest in ensuring that they only share information with a group that will keep it secure, or else the risk having those operating procedures become less effective, thereby risking their own operatives.
Second, adopting new tactics involves learning new technical skills. These skills require practice and expertise. Groups may be able to read about how to make a simple bomb, but that is a far step from being able to adapt those bombs to different circumstances and use them effectively as part of a cohesive campaign. Al Qaeda took detailed operational notes from Hezbollah on their bombing of the Marine compound, because the details were important. Reading is not the same as training. This may also apply to soft skills that must be learned. It is one thing for a group to ask an operative to die in an attack, and another to cultivate enough dedication to be certain the operative will do it rather than selling the organization out.

Because groups safeguard valuable tactical information from anyone but trusted partners, and the costs and risks of individual innovation, and social pressures resulting from the logic of appropriateness driving group preferences, groups are likely to prefer to adopt new tactics when they can learn them from another group. This leads to my primary hypothesis.

_H Direct Diffusion:_ Groups are more likely to adopt a tactic if they have a partner that has recently used this tactic.

### 3.4.4 Structures

Groups can learn directly from their partners. At first glance, this seems to mean that more partners should mean more exposure to more tactics, and more learning. But networks of violent actors are social networks, and not all groups are equal. The structure of partnerships is integrally related to which groups have influence, which specialize in learning, and which will be more
likely to emulate their partners. The number of partners a group has is important, but so is the constellation of those partnerships in relation to one another. Different patterns of partnerships, or network structures, shape the pattern of influence in the network. The two networks in Figure 3.1 are very different. Group (1) in Figure 3.1a is in an inherently different social context than a well-connected group in panel (b), and would be even if they had a similar number of partnerships. It is therefore insufficient to only consider the number of partners a group has. Moreover, group (1) is also in a different context than any other group in panel (a), meaning that it is also insufficient to only consider structure.

Figure 3.1a shows a centralised network. Centralised networks are networks in which one or a few members have much more influence than others. A group’s influence, as conceptualized here, refers to the number of partners a group has to learn from.\footnote{I use degree centrality instead of alternative forms of centrality because diffusion occurs along direct network ties. Degree centrality and degree centralization are likely to shape the extent to which pairs of groups can interact.} So in other words, in centralised networks, one or a few groups have many connections while others have very few. The most centralised possible network is a hub-and-spoke network, shown in Figure 3.1a. Decentralized networks, like the random network shown in (b), contain groups with on average the same number of partners.
In centralized networks, well-connected groups have structural power because the structure of partnerships gives them greater leverage. This structural power derives from the fact that central groups control access to the network. The only source of information in the network pictured above is through the most central group. For example, the PFLP invested in coordinating and training other groups in exchange for the operational control it gave them. This gave them leverage over their partners: in payment for access, the Japanese Red Army conducted attacks on their behalf. The Peshawar parties helped funnel funds and coordinate among their favorites in the Afghan Civil War, which gave them influence over political outcomes in part because they determined which groups survived and which were starved of resources.

The unique structural position of well-connected groups in centralized networks causes them to specialize in brokering information because of the resource demands of managing many asymmetric partnerships (Wahedi, working paper). Each partnership takes time and resources to maintain, meaning that groups must invest in a bureaucracy to handle them, which endows the group with the organizational capacity to contextualize and synthesize what they learn. This means that well-connected groups in centralized networks are more likely to gather information from their partners. For example, al Qaeda invests in a large bureaucracy in order to manage its partners (Shapiro, 2008), with operatives who serve as advisors and coordinators to other groups, with a formal chain of command and channels for analysis. Al Qaeda produces strategic documents, formal training manuals, and manages formal training camps.

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For example, despite the fact that the Medici family in Rome began as a relatively minor house, they were able to strategically use marriage ties to situate themselves as a go-between between more powerful houses (Padgett & Ansell, 1993). They used this structural power to create material power. Central groups in centralized networks can use similar leverage.
Structural power often corresponds to material power, because groups often coalesce around strong, secure, partners (Bapat & Bond, 2012). This suggests that these groups are more likely to have the capacity to adopt new tactics.

The marginal return to adding a partnership in a centralized network should be positive. Within centralized networks, the more partners a well-connected group has, the more groups they have leverage over, and the more they are able to extract resources from the network. This makes hubs more secure (Wahedi, working paper), freeing them to adopt new tactics. For poorly-connected groups, adding a connection means reducing the leverage held by the job, increasing the group’s influence and the demands it can make from its partners. A poorly-connected group with one more partnership is likely to attract more attention from its well-connected partners. This means that there are positive returns to partnership in both poorly- and well-connected groups in centralized networks.

The opposite is the case for decentralized networks such as the Kashmiri groups in Pakistan and India. In decentralized networks like the one pictured in Figure 3.1b, there are many redundant pathways, meaning no one group holds leverage over others, and information does not pass exclusively through any given partnership. Managing partnerships is costly, and more partnerships does not equate to more access or more leverage. As a result, there are likely to be decreasing marginal returns to partnerships in decentralized networks.

Decentralized networks tend to be less secure than centralized ones (Wahedi, working paper). This is because decentralized networks have no gatekeeper with the organizational capacity to vet members. In decentralized networks, if a weak group joins and that weak group is compromised by law enforcement (Morselli, Giguère, & Petit, 2007), or willfully shares
information with security forces (Bapat & Bond, 2012; Berman & Laitin, 2008), this leaves
groups more vulnerable the more connections they make, making both sharing and adopting new
tactics all the riskier.

In decentralized networks, groups with more connections also have more noise. This reduces
the impact of a single group adopting a tactic on their perceptions of the appropriateness of that
tactic. In other words, because they observe a broader array of tactics, they are less swayed by
observing any given one among groups they interact with. This is exacerbated by the fact that
groups in decentralized networks tend to be less homogenous in their tactical choices than groups
in centralized neighborhoods (See analysis in appendix). With many partners to choose between
and reduced capacity to sort the information, they are less likely to learn a given tactic if a
partner has adopted it than a peripheral group with less divided attention, or a well-connected
group in a centralized network that has the organizational capacity dedicated to learning.

Altogether, this leads to the following observable implication:

\[ H_{Structure}: \text{Well-connected groups in centralized networks are the most likely to adopt tactics from their partners. The reverse is true among decentralized networks.} \]

3.4.5 Competition

In addition to the cooperative network, groups also exist in a rivalrous network. Just like
competing states coevolve military technology in order to counter one another's advances,
militant groups that are always under existential competition must evolve their tactical approach.
When groups have competitors, they often engage in outbidding (Kydd & Walter, 2006).
Groups are likely to want to adopt new tactics when they have competitors in order to distinguish themselves in the eyes of their potential support base (Bloom, 2005).

But competitors also heighten the security risks groups face, which intensifies the tension between desire and risk. On the one hand, groups need to evolve in order to survive. On the other hand, experimentation is more dangerous when a group has more competitors.

These three pressures can be resolved. Groups with more rivalries are more likely to adopt tactics that are easier to learn. That means that any effect of rivalry on group propensity to adopt new tactics is mediated by the availability of tactical information from a group’s partners. On the issue of convergent evolution, increased competition makes experimentation more dangerous, meaning that groups are unlikely to emulate one another.

\[ H_{competition}: \text{Groups with more rivals are more likely to adopt new tactics that their partners use.} \]

### 3.4.6 Alternative Explanations

Several alternative explanations can be derived from the literature. If the diffusion and structure hypotheses are correct, then group observations are not independent. This means that in order to estimate any effects on the spread of violent innovations, network dependencies must be taken into account. By controlling for other factors that influence a group’s propensity to adopt certain tactics, we can increase our confidence in the learning hypothesis.

Groups will only be able to adopt tactics if they have the capacity to do so (Koehler-Derrick & Milton, 2017). Experimentation is difficult and expensive, but it does sometimes occur (Gill,
Because innovation can be risky, groups are more likely to innovate when they are more secure. For example, al Qaeda used a secure training camp in Afghanistan to create and test chemical weapons (bin Laden, bin Laden, & Sasson 2009). During this experimentation, Al Qaeda had secure access to territory, a strong organization, and ample resources, giving them the freedom to experiment while limiting the risk that they would be caught. I use three controls for group security: territory, organization size, and state sponsorship.

Following Berman and Laitin, religious groups that extract sacrifice should be more capable of creating dedicated members, which should in turn make them more secure and able to engage in suicide terror in particular, and adopt new tactics in general. I therefore control for the religious nature of the group.

Horowitz (2010) argues that groups that are set in their ways are less likely to adopt new tactics. This implies that young groups should be more likely to adopt tactics. Alternatively, older, more established groups may be more secure, and thus more able to adopt new techniques. This is counterbalanced by the fact that older groups are more likely to have already been exposed to tactics, making them less likely to adopt. Given these two competing possibilities, I control for group age.

To summarize, the core hypothesis examines a violent group's propensity to adopt a tactic given the use of that tactic by the group's partners. I predict that groups that have a partner that has used a tactic in the recent past are more likely to adopt that tactic because partner use shapes groups perceptions of efficacy, and reduces the barriers to learning. The structure of the network
of partnerships in which the group is embedded should shape a group's propensity to adopt new tactics, with central groups in centralized networks more likely to adopt tactics that are present in their network. Groups that have rivals are more likely to adopt new tactics that are present in their networks, but not to innovate new tactics on their own, or to emulate their rivals.

3.5 Empirical Strategy

3.5.1 Data

Network data were taken from the Big Allied and Dangerous 1 (BAAD1) dataset of militant group cooperative and rivalrous relationships (Asal & Rethemeyer, 2008b). These relationships were taken from the Terrorism Knowledge Base (TKB), compiled by the National Memorial Institute for the Prevention of Terrorism (MIPT). One limitation of the BAAD1 data is that they are static, representing whether groups ever had a relationship—a partnership, rivalry, or both—during the observation period. While this period in theory extends from 1968 through 2008 when the TKB stopped collecting data, in practice it corresponds most reliably to the years in which the TKB was collected, from 1998 to 2008. In some circumstances groups do shift their alliance patterns (Christia, 2012), but absent more detailed data on these dynamic shifts, these static data still provides a glimpse into the partnership behavior of groups. Moreover, personal relationships that have been formed likely remain, meaning that exposure is likely to persist over time. Those relationships that the TKB listed as both cooperative and rivalrous were excluded from the analysis. Only 18 out of 487 relationships in the data were reported as varying.

Tactical data were taken from the Global Terrorism Database hosted by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) (START, 2016).
The GTD contains attacks between 1970 and 2015. While the GTD is focused on terrorism, it uses a broad definition and allows users to select incidents based on narrower criteria. Because I am interested in violence writ large, I used the most permissive definition available in START.

Naming conventions in BAAD and GTD are different. Moreover, many groups change their name or evolve into new groups over time. I used the TORG crosswalk (Cousin, 2014), a dictionary comparing names used in several databases, to merge GTD into BAAD1. I then went through the list of unmerged names in BAAD, and hand matched them based on other known group names and variations in spelling. Out of 186 networked groups in BAAD1, 112, were active in GTD and had partners in BAAD1. The remaining groups were either isolates or too small or obscure to have activity in the GTD. The remaining groups are those which are candidates for network diffusion of tactics because they could both observe their partners and rivals, and have activity that we can observe. Detailed information on how these data were merged, which group names were considered to belong to which group, and code for replicating the merge can be found in the Appendix.

The network data are static, but not all groups existed during the entire study duration. One option is to only look at the years from 1998 to 2008. However, extending farther back in time means picking up on when groups actually adopted a tactic. This is important because groups can only ever adopt a given tactic once. If data were restricted to 1998-2008, there would be much less variation in the dependent variable of interest (adoption) because many groups would have already adopted tactics in the past. However, it would also be impossible for a group that does not yet exist to adopt a tactic. I therefore allow the network to vary over time based on group

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activity. A group is presumed to be active after its first attack, until two years after its last attack in the dataset.

3.5.2 **Dependent Variable: Adoption of Tactics**

A group adopts a tactic the first time it uses that tactic. The GTD contains information on the tactics used in any given attack. I used a list of tactics that occurred more than 100 times in the data, and that relate to violent skills rather than contextual strategic choice. For example, carrying out an assassination is a tactic because it is a general choice, a category of behavior. The type of target to assassinate is more specific to the individual groups' goals. A list of tactics is shown in Table 3.1.

It is possible that groups had already adopted a tactic before the beginning of the data. Because the data extend back into the 70’s, many of the groups do not yet exist at that time, which helps but does not resolve the issue entirely. However, this should work against the hypothesis: if groups had already adopted and use a tactic before the start of the data, then it will appear that they had adopted it at their first attack, likely before they’ve had a chance to observe another group adopting. The bias would be toward groups innovating on their own, rather than adopting from a partner, which would work against the hypothesis that groups learn from one another.

Observations are at the interval-group-tactic level, or the month-group-tactic level, depending on the statistical test. Time intervals are periods of time for a given group and a given tactic in which none of the time-varying covariates changed. If a partner or a rival adopts a tactic, a new interval begins. Observations are of groups that are eligible to adopt a new tactic. To be eligible,
a group has to be an active member of a network. Groups that have not yet conducted attacks, or who have not conducted attacks for 2 years, are considered to be inactive and therefore are not candidates for adoption. Groups are also ineligible if they have already used a tactic, because once it has already been adopted, the probability of adopting is 0, (they cannot adopt the same tactic twice). Groups that employed a tactic before entering the network are not eligible to adopt. There are 108,928 tactic-interval-group observations.

3.5.3 Direct Diffusion Hypothesis

To test the primary hypothesis, I extended spatial regression models to a network context (Cranmer & Leifeld, n.d.). I took the dot product of an indicator of the use of a tactic in a given group-interval, and a weights matrix tying group partnerships to observations. The weights matrix is a square matrix with height and width the length of the observed data. Each row and column corresponds to a given observation. For a row i, a column j is given a value of 1 if the corresponding observed attack-month was committed by the group's partner in the previous three years, and zero otherwise. Taking the dot product of an indicator of tactical use and the weights matrix creates a count of attacks by a partner that used a given tactic in the past three years. I took a boolean indicator of this count to indicate whether any partners that could teach them the tactic. I used a similar method to create a measure of whether rivals had conducted recent attacks, and whether they used the tactic in question. The indicator was constructed prior to limiting the observations to eligible groups.

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"With the exception of al Qaeda, whose last attack in the GTD was in 2011, but which continues to exist and support attacks through its affiliates."
To summarize, the variable created indicates whether a partner has engaged in a tactic at some time in the last three years. The framework in which I use the dot product of a weights matrix and an indicator is beneficial because it allows for more complex robustness checks, such as weighting past actions by partners by how long ago they occurred, or including the effects of partners’ partners as well. Only direct partners were examined in this analysis.

3.5.4 Network Structure Hypotheses:

Network statistics are calculated each month based on BAAD1 and group activity. Groups that had not yet conducted an attack, or who were not active for two years were considered inactive and excluded from the network. The one exception is al Qaeda, for which the final incident recorded in GTD was 2011, but which continued to exist and exert influence on its partners long after. For each month, I calculated the degree centrality, or number of partners, for the cooperative and rivalrous networks.

I also constructed a measure of the centralization of each group's local neighborhood for every month in time. This measure was adapted from Freeman (Freeman et al., 1979). Neighborhoods were measured as the centralization of a local neighborhood out to 2 degrees out from each group. This means a group’s local network included their partners, and their partners’ partners. $S_j$ is the centralization of the local-network surrounding group j. $C_D(p^*)$ is the degree centrality, or the number of partners, of the best-connected member of the neighborhood, and $C_D(p_i)$ is the degree centrality of each member of the neighborhood, i. Degree centralities are calculated including ties outside of the local network. The denominator refers to the maximum possible sum of differences if the connections between nodes in the neighborhood were to be
arranged into a hub-and-spoke network, with the hub being the group with the most connections outside the neighborhood (if there are any):

\[
S_j = \frac{\sum_{i=1}^{N} C_D(p^*) - C_D(p_i)}{\max \sum_{i=1}^{N} C_D(p^*) - C_D(p_i)}
\]

This measure varies from 0 to 1, with a hub-and-spoke network having a centralization score of 1 and a perfectly connected network with a score of 0. Dyads and isolates were given a score of 0. This centralization measure can be thought of as an indicator of how closely the neighborhood resembles a hub-and-spoke network.

This centralization measure also accounts for local structure while also considering the how the neighborhood is situated. The degree calculations within the centralization measure also included groups connected to local network members that were not within the local network directly. This allows the centralization measure to reflect neighborhoods that are offshoots of larger communities. A small decentralized community connected to a larger centralized community that could effectively transmit tactical information to the neighborhood would be considered more centralized than a small decentralized community that was not.

### 3.5.5 CONTROLS

BAAD1 contains several group-level covariates that can be used as measures of different forms of capacity. Specifically, it contains a categorical measure of group size, an indicator of whether the group has a state sponsor, and whether it controls territory. Group size categories were: 0-100 and low confidence, 100-1000, 1,000-10,000, and 10,000 and greater. I mapped
these onto an exponential scale: 1,10,100,1000. To control for Berman & Laitin's sacrifice and club goods hypothesis, I also included an indicator for whether the group is religious (2008).

### 3.6 Results

#### 3.6.1 Bivariate First Glance

Table 3.1 shows cross tabulations as a first test of the core hypothesis. The table lists, by tactic, the probability of a group adopting a tactic with and without having a partner that conducted the tactic in the past three years. The final column lists the z-score for a hypothesis test of whether the two probabilities were drawn from the same distribution. This amounts to an unpooled bivariate test of the core hypothesis, and is useful because it gives a sense of the raw data underlying the relationship. In all but one instance—constructing barricades—groups are more likely to adopt a tactic that a partner has used than to adopt a new tactic. In the case of barricades, the probability of adoption was about the same whether a group had a partner adopt first, or not.
Table 3.1. Unpooled Bivariate Cross-Tabs.
This table shows the rate of adoption among groups that have a partner recently using the tactic, and among those that do not. The final column presents a z-score indicating how likely it is that the two rates of adoption were drawn from different distributions.

| Tactic         | No Partner Use |          | P(adopt|no partner use) | Adopted | Not adopt | Total | P(adopt| partner use) | Z Score |
|----------------|----------------|----------|---------------------|---------|-----------|-------|-------------------|---------|
| Suicide        | 89             | 10       | 99                  | 0.101   | 29        | 33    | 62                | 0.532   | 6.018 |
| Hostage/Kidnap | 38             | 9        | 47                  | 0.191   | 40        | 47    | 87                | 0.540   | 3.906 |
| Assassination  | 26             | 14       | 40                  | 0.350   | 44        | 47    | 91                | 0.516   | 1.759 |
| Hijacking      | 89             | 10       | 99                  | 0.101   | 51        | 8     | 59                | 0.136   | 0.662 |
| Barricade      | 87             | 14       | 101                 | 0.139   | 40        | 5     | 45                | 0.111   | -0.456 |
| Kidnapping     | 46             | 9        | 55                  | 0.169   | 43        | 39    | 82                | 0.476   | 3.752 |
| Infrastructure | 53             | 21       | 74                  | 0.284   | 46        | 34    | 80                | 0.425   | 1.827 |
| Bomb use       | 4              | 6        | 10                  | 0.600   | 15        | 93    | 108               | 0.861   | 2.149 |
| Incendiary     | 46             | 11       | 57                  | 0.193   | 52        | 40    | 92                | 0.435   | 3.023 |
| Melee          | 54             | 14       | 68                  | 0.206   | 50        | 34    | 84                | 0.405   | 2.623 |
| Vehicle        | 121            | 5        | 126                 | 0.040   | 35        | 3     | 38                | 0.079   | 0.985 |
| Sabotage       | 126            | 7        | 133                 | 0.053   | 13        | 2     | 15                | 0.133   | 1.240 |
| Mail attack    | 56             | 18       | 74                  | 0.243   | 51        | 28    | 79                | 0.354   | 1.499 |
| Mine           | 56             | 15       | 71                  | 0.211   | 57        | 25    | 82                | 0.305   | 1.314 |
| Remote detonation | 100          | 18       | 118                 | 0.153   | 39        | 20    | 59                | 0.339   | 2.848 |
| Arson          | 84             | 22       | 106                 | 0.208   | 48        | 24    | 72                | 0.333   | 1.881 |
| Pooled         | 1080           | 209      | 1289                | 0.162   | 668       | 574   | 1242              | 0.462   | 16.324 |

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3.2 shows a pooled Kaplan Meyer plot of adoption rates over time of groups when they have had no partners adopting a tactic, and when they have had a partner adopting a tactic. Like the cross tabulations, this test is a first bivariate glance at the effect of partner use of a tactic on adoption. Unlike the cross tabulations, the survival plot is a pooled test: all tactics are included together. The unit of observation is group-tactic-time interval, where a time interval corresponds to time during which a group either was, or was not, exposed to a partner using the tactic. If a group's partner adopts a tactic, a new interval is created, and it jumps from the partner-use pool to the no-partner-use pool at the same time $t$. The plot shows that groups are more likely to adopt a tactic when they have a partner that has already adopted it and used it in the past three years.

The Kaplan Meier estimates also provide a first glance at the alternative theory that organizationally established groups are less likely to adopt new tactics (Horowitz 2010). The Kaplan Meier plot shows the probability of adopting given that a group has not yet adopted. If
older groups that have not yet adopted are less likely to adopt a tactic, we would expect to see a strong curve in the survival plot. Among groups that have no partners using a tactic, there is only a slight decrease in the rate of adoption over time. This decrease is more pronounced for groups that have a partner who adopted, but even at the fifteen-year mark, groups are still adopting new tactics at a high rate. Horowitz argues that only new groups should be more likely to adopt, but fifteen-year-old groups are already well established. Moreover, both supply and demand pressures are operating: by fifteen years, most groups remaining in the eligibility pool are groups that have chosen not to adopt. Those for whom adopting was strategically advantageous had already adopted. There is not clear evidence to support the hypothesis that age affects adoption generally. However, there is a curve, especially in later months, so the modeling approach must account for the change in hazard over time.

3.6.2 **Partially Pooled Modeling Framework**

Neither pooled nor unpooled analyses accurately represent the dependence structure of the data. Pooled analyses do not account for differences in individual groups' propensity to adopt a tactic, or in the differences in diffusion among different groups. Unpooled analyses fail to account for similarities in diffusion processes across tactics. I used a flexible Bayesian mixed effects model in order to get the best of both worlds. While each group may have a different underlying propensity to adopt, and diffusion dynamics for each tactic may be different, a multilevel model allows us to assume that they are drawn from a similar data generating process. In a multilevel model, intercepts and coefficients can be different for each category, but can be thought of as being drawn from a normal distribution with a common mean.
Another important benefit of a mixed effects model is that it provides a test of the model in a context where little is known about individual groups. Because violent organizations are illicit and secretive, there is limited reliable data about them, especially in the case of smaller groups, or groups that existed in non-English speaking areas before the internet. Excluding these groups because of lack of data would create a bias. A multiple effects model allows us to specify a unique baseline propensity for adoption for each group based on the observed data, which reduces our reliance on covariates for the propensity of groups to adopt. In light of the debate on geographical diffusion, and whether observed diffusion effects are only a result of spatial clustering of predictors of violence, handling group-level variation is all the more important (Buhaug & Gleditsch, 2006; Fearon & Laitin, 2003; Gleditsch, 2007; Maves & Braithwaite, 2013; Salehyan & Gleditsch, 2006).

I use a mixed effects logistic regression, with random effects and intercepts for each tactic, and fixed effects for each violent group. The group-level effects include group-level covariates on religion, size, territorial control, and whether the group has a state sponsor. Group effects help to account for unobserved variation in group propensity to adopt any tactic. Tactic-level mixed effects account for variation in the diffusion dynamics of different tactic types due to unobserved covariates.

Following Carter & Signorino (2010), I approximate a survival model using time, time squared, and time cubed terms. Third order time polynomials can approximate a spline approximation of a hazard model (Beck, Katz, & Tucker, 1998). This reduces the need to appropriately specify splines, and creates a more easily interpretable model specification, and can be more flexible than a proportional hazard model. The model in full is as follows:
Likelihood:

\[ c_k \sim N(\mu_c, \sigma_c^2) \]

\[ \beta_k \sim N(\mu_\beta, \sigma_\beta^2) \]

\[ \mu_\alpha = \gamma_0 \times \gamma u \]

\[ \alpha_j \sim N(\mu_\alpha, \sigma_\alpha^2) \]

\[ \hat{y} = \alpha_j + c_k + \beta_k AX + \theta Z + t + t^2 + t^3 \]

\[ P = \text{logit}(\hat{y}) \]

\[ Y \sim B(P) \]

\( c_k \) are tactic-level fixed effects, \( \beta_k \) are tactic-level random effects for \( AX \), the indicator of partner-use in the previous three years. \( \alpha_j \) are group-level fixed effects with group covariates \( u \), coefficients \( \gamma \), and intercepts \( \gamma_0 \). \( \hat{y} \) is the change in propensity for adoption. \( \theta \) is a vector of covariates corresponding to interval-tactic-level observations of network structure, \( Z \). \( t \), \( t^2 \), and \( t^3 \) represent the time since the group became active, in months. \( P \) is the logit transform of \( \hat{y} \), and is the probability of adopting a tactic in a given month.

The monthly covariates \( Z \) include: (1) the centralization of the group’s local network, (2) the number of active partnerships a group has, (3) two way and three way interactions between centralization, number of partners, and whether a group has partners who have conducted an attack, (4) the number of rivals a group has, (5) an interaction between the number of rivals a group has, and whether that group has partners who have engaged in a tactic.
To aid with sampler convergence and avoid biased estimates, I used an asymmetrical sampling procedure (Betancourt, 2017). Higher level effects used a flat hyperprior, transformed into a normal distribution as follows:

\[ \text{hyperpriors} : \]
\[ \mu_c \sim N(0, 100^2) \]
\[ \sigma_c^2 \sim HalfCauchy(B = 2.5) \]
\[ \mu_\beta \sim N(0, 100^2) \]
\[ \sigma_\beta^2 \sim HalfCauchy(B = 2.5) \]
\[ \gamma_0 \sim N(0, 100^2) \]
\[ \gamma \sim N(0, 100^2) \]
\[ \sigma_\alpha \sim HalfCauchy(B = 2.5) \]
\[ \epsilon_\alpha \sim N(0, 1) \]

\[ \text{Priors} \]
\[ \alpha_i = \gamma_0 + \gamma * u + \sigma_\alpha^2 * \epsilon_\alpha \]
\[ c_k \sim N(0, 100^2) \]
\[ \beta_k \sim N(0, 100^2) \]
\[ \theta \sim N(0, 100^2) \]

I used a Metropolis sampling for initialization and scaling, followed by a more efficient No U-Turn Sampler to sample the covariate space more smoothly (Hoffman & Gelman, 2014). Sampling was computed using the PyMC3 in Python (Salvatier, Wiecki, & Fonnesbeck, 2016).

Estimated effects for the model are presented in Figure 3.3 (without interaction effects) and Figure 3.4 (with interaction effects). The posterior distributions and sample traces are presented in the reference. Each figure contains estimates from three Monte Carlo chains, or three separate runs of the model, to test for model stability and convergence. The estimates on the left of the plot indicate the effect estimates to the 95% confidence level. On the right, R-hat is a measure of
model convergence, and should be as close to 1 as possible signifying that the three traces are the same. Measures greater than 1.2 are considered non-converged.

A note on interpreting coefficient estimates: all coefficient estimates reflect changes in the latent variable \( \hat{y} \) rather than changes in the probability of adoption itself. \( \hat{y} \) is distributed normally with mean determined by parameters and covariate values for each observation. It is then transformed into a probability with a Bernoulli distribution using a logistic transformation. A positive coefficient corresponds to a positive increase in \( \hat{y} \) as a variable is increased, which corresponds to a greater probability of adoption.

3.6.3 **Direct Diffusion Hypothesis**

To test whether groups are more likely to adopt a tactic when they have been exposed to a partner that uses the tactic, I used an indicator of whether a partner had used the tactic within the previous three years. While groups can learn from partners who no longer use a tactic—al Qaeda approached Hezbollah to prepare for their embassy bombings years after Hezbollah’s Marine barracks attack—the three-year limit was imposed to create a harder test for the hypothesis. Without the nuance of a case study, it is harder to make a case that a group has learned a tactic from a partner if that partner had ceased using the tactic years before. I used three years instead of fewer because large scale attacks are rare events that often take a long time to plan, making a three year window a reasonable hard test for the hypothesis.
Figure 3.3. Diffusion Model Main Effects.
Coefficient estimates are plotted on the left. Each coefficient has three estimates from different Monte Carlo Markov Chains. The R-hat is a measure of model convergence based on the similarity of the chains and should be close to 1. Coefficients represent changes in propensity to adopt a tactic in a given month in a multi-level logistic regression.
Figure 3.4a. Full Diffusion Model Results.
Coefficient estimates are plotted on the left. Each coefficient has three estimates from different Monte Carlo Markov Chains. The R-hat is a measure of model convergence based on the similarity of the chains and should be close to 1. Coefficients represent changes in propensity to adopt a tactic in a given month in a multi-level logistic regression. Rival use cut off for scale, see cutout in Figure 3.4b.
The main effect of partner use, shown in Figure 3.3, is statistically and substantively significant, suggesting that groups are more likely to adopt tactics that their partners use. In the full model with interactions, partner use also increases the propensity to adopt a tactic in every condition. To see this, examine each negative interaction with its simple main effect. First, the interaction between centralization and partner use. The magnitude of the negative interaction is less than the sum of the two positive simple main effects: when accounting for the simple main effects, groups in highly centralized communities are still more likely to adopt when a partner has used a tactic. Second, the magnitude of the negative interaction between number of partners and partner use is less than the sum of the simple main effects for partner use and number of partners until a group has more than nine partners—which is a lot of partners in this context. I will return to this point below. Overall, groups are more likely to adopt a tactic when a partner has used it first.

3.6.4 **COMPETITION HYPOTHESIS**

Competition does increase the propensity of groups to adopt new tactics (as a main effect as shown in Figure 3.3, and a simple main effect as shown in Figure 3.4). Groups do not emulate their partners (especially when they have a partner that can teach them the tactic (as shown in the

![Figure 3.4b. Cutout of Rival Use Effect.](image-url) Coefficient for rival use was plotted separately to allow effective figure scaling.
interaction between partner use and rivals). However, they are more likely to adopt a tactic that a
partner uses (interaction between rivals and partner use).

3.6.5 Network Structure Hypothesis

The structural theory suggests that well connected groups in centralized networks where they
have asymmetric influence should be the most likely to adopt. More generally, returns to
partnerships should result in greater tactical diffusion in centralized networks, but the reverse
should be true in decentralized networks.

I do not find a significant main effect of centralization. Degree is significant, with a mean of
.12, meaning that on the whole, groups with more partners are more likely adopt more tactics.
The main effects show average effects, however. In order to test the hypothesis, a three-way
interaction between centralization, number of partners, and partner use is needed. If the
hypothesis is correct, we should observe the following:

(1) The effect of partner use should be strongest in better-connected groups in centralized
networks.

(2) The effect of partner use should be weakest in among well-connected groups in
decentralized networks.

(3) The effect of increasing the number of partnerships should increase the effect of partner
use in centralized networks (better-connected groups should learn more from their partners in
centralized networks).
The effect of increasing the number of partnerships should *decrease* the effect of partner use in decentralized networks (better-connected groups should learn less from their partners in decentralized networks).

To ease interpretation of the 3-way interactions, Table 3.2 shows the predicted changes in a group’s propensity to adopt a tactic, ŷ, given different values of the interacted covariates. The left column represents propensity to adopt when a partner uses the tactic, while the right column represents propensity to adopt when no partners use a tactic.

1. Well-connected groups in centralized networks are the most likely to adopt a tactic. A group with 5 or 10 partners in a centralized network has an increased propensity to adopt a tactic, relative to a group with no partner use, of 3.185 or 2.891, respectively.

2. Well-connected groups in decentralized networks are the least likely to adopt a tactic used by a partner. While the change in propensity to adopt a tactic among groups with only one partner is 2.319, it is only .607 for groups with five partners, and is actually negative, at -1.533, among groups with 10 partners, though this later case is less likely to emerge in a decentralized community.

<table>
<thead>
<tr>
<th>Group Descriptors</th>
<th>Partner Use</th>
<th>No Partner Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralized network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 partner</td>
<td>1.802</td>
<td>0.513</td>
</tr>
<tr>
<td>5 partners</td>
<td>2.878</td>
<td>-0.307</td>
</tr>
<tr>
<td>10 partners</td>
<td>4.223</td>
<td>1.332</td>
</tr>
<tr>
<td>Decentralized network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 partner</td>
<td>2.441</td>
<td>0.122</td>
</tr>
<tr>
<td>5 partners</td>
<td>1.217</td>
<td>0.61</td>
</tr>
<tr>
<td>10 partners</td>
<td>-0.313</td>
<td>1.22</td>
</tr>
</tbody>
</table>
(3) There are diminishing marginal returns to partnership in centralized communities, but they are always positive. As groups gain in partnerships, they become more likely to adopt tactics. This can be seen from Table 3.2, but also by examining the interaction terms directly. All interaction terms are statistically significant. The interactions between number of partners and partner use, and number of partners and centralization, are both negative. However, the magnitude of the sum of negative coefficients is less than sum of the simple main effect of number of partner’s and the three-way interaction between number of partners, partner use, and centralization. This means that the there is a net boost every time a partner is added, but that the boost gets smaller with each additional partner.

(4) In decentralized networks, groups with more partners are actually less likely to adopt a tactic that a partner uses with every additional partner. This is because the magnitude of the negative effect of the interaction between number of partners and partner use is greater than the positive effect of number of partners. While groups in decentralized networks still receive a boost from the simple main effect of partner use, they have lower propensity to adopt a tactic with each additional partner.

The analysis has confirmed all three hypotheses. Groups are more likely to adopt a tactic when a partner has used it. This is especially the case when groups compete with rivals, though they are not more likely to emulate rivals, which provides some evidence that groups are actually learning from partners rather than merely adopting tactics based on the pressures unique to their conflict: competitors within a conflict are likely to face similar circumstances and make similar
choices but do not emulate one another. Well-connected groups in centralized communities are more likely to adopt new tactics than well-connected groups in decentralized communities.

Finally, when accounting for cooperative and competitive interdependencies, many traditional explanations for tactic adoption lose significance. The only one still significant at the 95% confidence level is age: groups are less likely to adopt new tactics as time goes on. With a mean of -.006, a 15 year old group is has a decreased propensity to adopt a tactic of 1.08. This may be due to the fact that after 15 years, groups that have failed to adopt a tactic have lower desire.

3.7 CONCLUSION

One potential limitation of the study, common to many network analyses, is that it is difficult to disaggregate between homophily and network effects. In other words, rather than partner behavior affecting a group's propensity to adopt a tactic (network effects), it may be that groups that have a similar inclination towards certain tactics are more likely to align with one another (homophily). This is a problem inherent to the study of complex systems, and it is likely that there are feedback loops of diffusion and homophily. Temporal network data might help to some degree, but even then, outside an experimental setting it is impossible to ever determine whether groups with similar propensity towards a given tactic are more likely to partner (Shalizi & Thomas, 2011b). Even if it can be demonstrated that some partnerships were exogenously driven, the fact that most aren't, and that behaviors exist within a system, makes it difficult to distinguish effects.

The difficulty in distinguishing between network effects and homophily does not mean that network studies are invalid, however. Ignoring the problem does not make it go away: this study
effectively demonstrates that observations of group behavior are not independent, meaning that the fundamental assumptions underlying non-network models are violated. This seemingly puts researchers in a catch-22: non-network models are invalid because observations are not independent, but causality is more complicated in a network model. All this means, however, is that reality is more complicated. Explicitly modeling network effects helps us to better describe reality. By explicitly accounting for this interdependence, this analysis takes a significant step in the right direction.

The only thing that can help disaggregate between network effects and homophily is contextual richness. Studies of suicide terror have described groups explicitly learning from one another. Other examples of groups going out of their way to learn tactics from one another abound. This context helps increase the credibility of the model: direct diffusion appears to be occurring on a general scale. Like early geographical contagion studies, this study is the beginning of a conversation that will add richness and context to the conditions under which learning occurs, and the extent to which it is also an endogenous process.

Network effects and homophily often come together as an endogenous process contributing to diffusion. Groups adopt tactics because they are exposed to them by their partners, but they also seek partners out in order to teach them tactics, as al Qaeda did with Hezbollah. Both processes contribute to the diffusion of tactics that we observe among groups. Rather than pretending that they are exogenous, researchers should embrace the processes that are reflected in the world. As Bakke (2013) described, the logic of appropriateness does play a role in the tactics that groups adopt. That groups choose to partner with others that employ the sort of
tactics that they admire does not detract from the observation that groups are embedded in a social network of learning and influence.

These findings have important implications for policy makers. The first is that policy makers should anticipate future tactical innovations of groups based on what known collaborators have used in the past. This should help security forces better harden targets and protect against future attacks. Second, policy makers should consider how groups are situated within their network of partners. Groups with many partners that are embedded within a decentralized network are less likely to adopt new tactics than those with fewer partners. On the other hand, ring-leaders with many partners are more likely to pick up any innovations those partners might have. Tactical innovation is also more likely when groups are in competition, but policy makers should look to external partners to predict the new tactics that groups will adopt rather than expecting groups to behave like one another.

This study is the first step toward understanding the ways in which violent organizations learn from one another and adapt. It is a continuation of the contagion discussion, opening a new branch for future research. Future work should consider further exploring the context in which learning occurs. Are some tactics more likely to diffuse through a network than others? How do operational constraints affect diffusion? Are there other network structures that constrain diffusion behavior? Can evidence of diffusion be observed in the non-violent behavior of violent organizations, and how does it relate to diffusion of non-violent behavior among dissent groups more generally, ranging from political parties to peaceful opposition movements, to ethnic groups and interest groups. Does diffusion occur across these categorical lines? Understanding
this broader puzzle is critical for understanding conflict and opposition dynamics, as well as for helping security forces to protect against the spread of violence.
APPENDIX A: EIGENVECTOR CENTRALITY STANDARDIZATION

There is no straightforward way to calculate eigenvector centrality for a disconnected network. Different standardization procedures measure slightly different things, and which is chosen should depend on theoretical considerations. To understand the problem, consider the eigenvector centrality of several idealized networks. Figures A.1a and A.1b show the eigenvector centrality idealized hub-and-spoke networks, while 2c shows the eigenvector centrality of an idealized interconnected network. One important anomaly that is difficult to distinguish in the figure, but is worth pointing out, is that the centrality of the primary hub in A.1a is lower than that of the secondary hubs. This measure therefore does not perfectly reflect the importance of hubs theorized above.

Eigenvector centrality is more appropriate for identifying influential nodes in an interconnected network than a centralized network. However, by and large, eigenvector centrality identifies more influential groups in

Figure A.1. Measures of Eigenvector Centrality.
each topology, when there is only a single community in the network.

Eigenvector centrality can be compared across communities once the measure has been standardized. Whether interconnected networks or hub-and-spoke networks are favored by eigenvector centrality depends on the standardization method used to compare communities. Panel (f) scales the eigenvectors by their dominant eigenvalue. This method tends to favor influential nodes in interconnected networks more than hubs. Panel (h) shows standardization by group size, a method used by *ORA.ww The centrality of the most influential nodes in interconnected networks is similar to that of spokes, but this relationship is highly dependent on the density of the interconnected networks.xxx Another method is to scale the dominant eigenvector of each component by the maximum eigenvector centrality in the entire population, as in panel (h).yy

Finally, eigenvector centrality can be standardized by dividing each member of a component by the Euclidean mean of the eigenvector, (Ruhnau, 2000). All four implementations place hubs, interconnected nodes, and spokes on a single spectrum, and therefore have difficulty distinguishing the effect of network structure. While each normalization procedure is correlated with the others, each only explains between 18% and 78% percent of variation in the others. Which is used, therefore, should depend on the hypothesis in question, and how interconnected nodes are theorized to relate to hubs.zz

ww *ORA is the network analysis software developed by the Center for Computational Analysis of Social and Organization Systems.
xx The eigenvalue is the scalar of the eigenvector.
yy This is the technique used in IBM’s i2 Analysts Notebook.
zz Note that while the final three standardizations appear similar in the graphs shown, this will not always be the case. Standardizing by group size weights larger groups, while IBM’s method of scaling by the maximum value depends on the characteristics of each community in the network, and is somewhat arbitrary. Euclidean mean standardization results in a more relative measure, in which groups who have greater centrality relative to others in their community are given a higher measure of global centrality.
The dangers of improper standardization are highlighted by Horowitz & Potter’s (H&P) analysis. H&P did not use any standardization. Instead, they took the eigenvector of their entire adjacency matrix, despite the fact that there are unconnected components. The eigenvector associated with the dominant eigenvalue for disconnected graphs does not accurately represent the relative eigenvalues of all components, and is not even guaranteed to represent the largest component accurately. Panels (d) and (e) show some of the consequences for doing this on different network topologies. The centrality of node 1, in this example, depends entirely on the density of a network to which it is not connected. A slight change in the density of the interconnected network shifts the dominant component. Figure A.2 shows a map of the network color coded according to H&P’s measure centrality. The measure favors the largest component, even though all components were included in the analysis. All their analysis says, therefore, is that the al Qaeda network is more lethal than any other, and being more closely connected to al Qaeda increases a group’s lethality. In order to explore how

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aa They do not specify in the paper, their replication data of eigenvector centrality contains negative numbers, which only occur if they either took the eigenvector from a non-dominant eigenvalue, or if the network is disconnected.
network position and network structure mediate behavior more generally, a more nuanced set of measures are needed.
APPENDIX B: MODEL RESULTS FOR ALTERNATIVE MEASURES OF CENTRALIZATION

Figure B.1. Eigenvector Centralization.
Figure B.2. Eigenvector Centralization with Interactions.
Figure B.3. Local Centralization. Degree calculation excludes partners outside local network.
Figure B.4. Local Centralization with Interactions. Degree calculation excludes partners outside local network.
APPENDIX C: TERRORIST ALLIANCE NETWORK LITERATURE

While many studies have looked at terrorist networks between individuals (Perliger & Pedahzur, 2011), only four studies have explored network effects at the group level. These initial findings support the idea that alliance networks matter. However, these early forays failed to account for structural network effects.

Asal and Rethemeyer (A&R) made the first contribution to the networked study of terrorist groups (Asal & Rethemeyer, 2008). Their most important contribution was the compilation of the Big Allied and Dangerous dataset, which includes information on degree centrality of organizations, but unfortunately excludes the alliances themselves, precluding its use for more sophisticated analysis. While their study may have sparked discussion of the importance of network analysis, it failed to launch a research agenda because of the absence of data.

A&R's foundational paper focuses on the determinants of lethality writ large. One of their determinants is the number of alliances a group has, or degree centrality. They find that degree centrality is correlated with increased lethality. This finding suggests either that having alliances increases lethality, or that more lethal groups tend to ally with one another, or both. If the former, then disrupting alliances should disrupt the level of violence in the system. Unfortunately, it is nearly impossible to determine whether an apparent network effect is causal, or due to homophily, even in analyses with ample data (Shalizi & Thomas, 2011). Terrorist groups provide an even more difficult case, because they form a dark network which is largely unobserved. It is difficult enough to determine whether two groups ever had an alliance, making it nearly impossible to collect reliable time-course data. Groups may or may not have an interest in announcing formal, ideological, alliances, but they have an interest in concealing cooperation
with criminal networks or with groups with whom they do not have an ideological affiliation. For the time being, any study of terrorist alliances will have this limitation.

Phillips (2013) takes the theoretical story a step further. He argues that alliances can help groups mobilize resources, which in turn helps them increase their ability to survive. He finds that longevity is predicted by alliances. Longevity is an ambiguous measure of group strength, in part because groups that end sometimes do so because they succeeded in extracting concessions or because they were incorporated into the nonviolent political process (Jones & Libicki, 2008). If groups terminate their violent wings, is that a predictor of group death, or group success? Most groups that end do not succeed, however, so Phillips' finding is another piece of evidence suggesting that alliances matter, and may confer benefits.

Unlike A&R, Phillips does consider network structure, but his consideration is limited. He looks at alliances during two periods, and shows visually that contrary to popular belief, terrorist alliance structure used to look similar to alliance structure today. However, he does not theorize about structural effects which may mediate any effects of network position.

The third piece critiques A&R's approach and offers another understanding of how alliances matter. Horowitz and Potter (H&P) theorize that who groups are allied with matters. Groups with better connected allies should confer greater goods. H&P use eigenvector centrality, which is a measure of a group’s influence in a network. Groups who have allies who also have many allies are more central than groups with more isolated allies. They find that eigenvector centrality predicts lethality better than degree centrality and conclude that who terrorists ally with is more important than how many alliances they have. H&P are correct that who a group is allied with matters, but as I will discuss below, their eigenvector centrality measure is poorly constructed.
One recent study does look at network structural effects, albeit in the context of a civil war. Metternich and colleagues in the Ward lab (2013) are concerned with free riding: if one rebel group is willing to engage in risky violence, then ideologically similar groups should free ride off of the other group’s efforts. They build off of Bramoulle, Kranton & D’Amours’ (BKD) formal network model of collective action (2014). BKD demonstrate that collective action problems in networks with lower minimum eigenvalues have corner solutions, while greater minimum eigenvalues are associated with networks with unique interior or corner solutions. Lower eigenvalues are associated with more disjointed, clustered networks, while higher eigenvalues are associated with more uniformly interconnected networks. BKD also find that in interconnected networks, effort is uniform but low. In disjointed networks, effort is zero in many segments of the network, but that effort is high in clusters of innovation, making global effort higher. Metternich and colleagues show that these predictions are supported by the behavior of Thai rebel groups. The Metternich study explores the effect of network structure among a collection of groups with common goals and a common enemy. The present study goes a step further to explore the effects of two dimensions of network features on violent group behavior in a broader context.
APPENDIX D: TACTICAL SIMILARITY WITHIN LOCAL NETWORKS

Theory

Centralized local networks facilitate the quick diffusion of information, which is especially beneficial in large networks where it would be too costly to process information from all other groups (Wahedi, working paper). It may not be possible to observe the spread of information directly through a dark network, but we can view the spread of tactics. If groups in a network are more willing to teach one another, there should be greater tactical similarity among groups, and groups that are in a better position to learn should have greater individual tactical diversity. This means that more central groups in interconnected or centralized networks should have more diverse tactics, but since centralized networks facilitate learning more readily than decentralized networks, this effect should be stronger for well-connected groups in centralized local networks.

Data and Empirical Strategy

For this robustness check, I used an alternative measure of network community. Specifically, I used the Newman Girvan algorithm to identify 439 communities in the network data, the majority of which are isolates (Girvan & Newman, 2002; Newman & Girvan, 2004). Any more than 439 and the algorithm begins to pick apart al Qaeda’s immediate network. Any fewer, and several of the larger communities begin to merge. The breakdown of community structure is shown in Figure D.1.
Diffusion of Information

I use the *tactical similarity* between groups as a proxy for the diffusion of information and technology across groups. Partnered groups share violent innovations with one another in order to either mutually gain, or better target a common enemy. Partners also train together and share with or purchase weapons from one another. This suggests that partnered groups will have more tactical similarities than groups that do not share.

This measure is not perfect. It could also be that groups with similar tactics tend to ally with one another, or that groups with common enemies or circumstances both partner with each other and tend to adopt similar tactics because they work in similar contexts. It may also be that more lethal groups are more likely to form alliances than weaker, less lethal groups, and that stronger groups have more similar tactics simply because they are the groups that adopted more effective tactics to begin with. All of these mechanisms are likely to be at play, and distinguishing between network effects and homophily is difficult even in the best of times, let alone in dark networks (Shalizi & Thomas, 2011a). However, case studies have shown that groups do share information with one another, and so variation in the level of similarity between groups in different positions in different structures is likely to be driven, at least in part, by their position in the network, (Fair 2004; Horowitz 2010; Horowitz & Potter 2014). Given that we know it happens, and absent visibility into a more direct measure of information transference, tactical similarity is the best available proxy. Many of the possible confounds should apply equally to all militant communities, so variation between them is likely driven, at least in part, by structure.

To measure tactical similarity, I take all operational variables included by Horowitz & Potter in their replication data (Horowitz et al., 2015). These attributes were assembled into an attribute
matrix in which each group is a row, and categories of weapons, targets, and other tactical information are columns. If a group used a particular tactic during the study period, I place a ‘one’ in the relevant column for that group. This attribute matrix is then used as a list of multidimensional coordinates. A list of attributes is presented in Table D.3. Similarity between groups is calculated using the Euclidean distance between them. Community similarity is measured as the average distance between all groups in the community. Group similarity to the rest of the community is measured as the distance of that group to the community’s centroid.

I also construct a measure of *tactical diversity*, which measures the breadth of tactics employed by a group or community. Tactical diversity is not the opposite of similarity. Similarity measures distance between groups, while diversity measures how many different tactics are employed. Both measures are necessary because communities that facilitate learning are theorized to have both greater similarity with respect to one another, and greater tactical diversity because they have learned more techniques. In communities with less learning, tactics will become less aggregated, and groups should have both lower diversity and lower similarity.

*Results*

I hypothesized that groups in centralized communities will be more similar than groups in interconnected communities, and that this effect should be stronger for larger groups. Figure A.1 shows the distribution of similarity across communities in the network. The first two models regress the average tactical similarity between all members in the community. The second two interact similarity with size. All four models only include groups with allies, because the variable of interest cannot apply to unallied groups. Table D.1 shows the results. In all four models,
centralized networks predict greater tactical similarity within the community. This effect does not appear to be mediated by size, however. This suggests that groups in centralized networks are more similar to one another than groups in interconnected networks.

I also hypothesized that more central groups should employ more diverse tactics than peripheral groups, and that this effect should be stronger in centralized networks. Figure D.2 shows the distribution of tactical diversity across groups in the network. This hypothesis is tested using two sets of linear models. In the first set, tactical diversity is regressed on a group’s centrality. In the second set, centrality is interacted with centralized structure to determine whether the effect is stronger in centralized communities. The first four models use degree centrality as the measure of group centrality, while the second four use eigenvector centrality. Models D2.1 & D2.2, and D2.5 & D2.6 look at the relationship between centrality and tactical diversity, while D2.3 & D2.4, and D2.7 & D2.8 include an interaction with degree skew. The results are presented in Table D.2.
Models D2.1, D2.2, and D2.5 all predict that centrality is significantly correlated with tactical diversity. In Model D2.6, Eigenvector centrality is not quite statistically significant, (P=.154). Overall, however, these results support the hypothesis that centrality predicts greater tactical diversity, especially since eigenvector centrality is a dubious measure when comparing across different communities, and because degree centrality is a better measure of structural position in centralized groups. The results from Models D2.2 and D2.6 also suggest that members of centralized communities employ a significantly broader repertoire of tactics. The results for the interaction are less clear. The interaction between degree centrality and centralized structure is not remotely significant, but the interaction between eigenvector centrality and centralized structure is significant in Model D2.7. The introduction of controls in Model D2.8 reduces the confidence that the estimate is different from zero to 80%, however. Overall, I conclude that both structure and position predict the breadth of tactics employed by groups, but that these effects are unlikely to be multiplicative.
### Table D.1. Centralized Structure on Tactical Similarity.

<table>
<thead>
<tr>
<th></th>
<th>Model D1.1</th>
<th>Model D1.2</th>
<th>Model D1.3</th>
<th>Model D1.4</th>
</tr>
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<tbody>
<tr>
<td>Centralized</td>
<td>0.738** (0.228)</td>
<td>1.241*** (0.232)</td>
<td>0.829** (0.243)</td>
<td>1.356*** (0.250)</td>
</tr>
<tr>
<td>Size</td>
<td>0.002 (0.009)</td>
<td>-0.007 (0.008)</td>
<td>0.043 (0.039)</td>
<td>0.031 (0.034)</td>
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<tr>
<td>CentralizedXSize</td>
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<td>-0.048 (0.045)</td>
<td>-0.044 (0.038)</td>
<td></td>
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<td>Num Events</td>
<td>0.001* (0.001)</td>
<td>0.001* (0.001)</td>
<td>0.001+ (0.001)</td>
<td>0.001* (0.001)</td>
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<td></td>
<td>-0.194 (0.163)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>0.013* (0.006)</td>
<td></td>
<td>0.013* (0.006)</td>
</tr>
<tr>
<td>Religious</td>
<td>0.467** (0.156)</td>
<td></td>
<td></td>
<td>0.453** (0.155)</td>
</tr>
<tr>
<td>Ethnic</td>
<td></td>
<td>0.129 (0.162)</td>
<td></td>
<td>0.097 (0.163)</td>
</tr>
<tr>
<td>Leftist</td>
<td></td>
<td>0.083 (0.162)</td>
<td></td>
<td>0.033 (0.167)</td>
</tr>
<tr>
<td>Territory</td>
<td></td>
<td>0.003 (0.145)</td>
<td></td>
<td>0.007 (0.144)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.168* (0.082)</td>
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<td>0.068 (0.124)</td>
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<td>n</td>
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<td>55</td>
<td>37</td>
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<tr>
<td>Adjusted R^2</td>
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<td>0.706</td>
<td>0.469</td>
<td>0.71</td>
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Note: +p<.1. *p<.05. **p<.01, ***p<.001  
Standard errors in parentheses
Table D.2. Centralized Structure and Centrality on Tactical Diversity.

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<tr>
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<th>Model D2.1</th>
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<th>Model D2.3</th>
<th>Model D2.4</th>
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<td>Degrees</td>
<td>0.172*** (0.016)</td>
<td>0.113*** (0.021)</td>
<td>0.060 (0.090)</td>
<td>0.095 (0.115)</td>
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<tr>
<td>Eigenvector</td>
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<td></td>
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<tr>
<td>Centralized</td>
<td>0.074 (0.224)</td>
<td>0.738* (0.329)</td>
<td>-0.144 (0.283)</td>
<td>0.699+ (0.412)</td>
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<tr>
<td>DegreesX Centralized</td>
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<td>0.137 (0.109)</td>
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<td>0.021 (0.138)</td>
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<td></td>
</tr>
<tr>
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<td>-0.002 (0.004)</td>
<td>-0.009+ (0.005)</td>
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<td>0.027*** (0.005)</td>
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<tr>
<td>Religious</td>
<td>0.085 (0.118)</td>
<td></td>
<td>0.085 (0.118)</td>
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<tr>
<td>Ethnic</td>
<td>-0.118 (0.120)</td>
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<td>-0.116 (0.121)</td>
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</tr>
<tr>
<td>Leftist</td>
<td>-0.043 (0.233)</td>
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<td>-0.046 (0.234)</td>
<td></td>
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<tr>
<td>Territory</td>
<td>0.343* (0.153)</td>
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<td>0.345* (0.154)</td>
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<td>1.717*** (0.192)</td>
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<td>147</td>
<td>247</td>
<td>147</td>
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<td>0.328</td>
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<tr>
<td>Eigenvector</td>
<td>59.27*** (12.30)</td>
<td>20.21 (14.11)</td>
<td>-248.15** (88.67)</td>
<td>-99.64 (95.03)</td>
</tr>
<tr>
<td>Centralized</td>
<td>0.057 (0.261)</td>
<td>0.875* (0.358)</td>
<td>-0.752* (0.344)</td>
<td>0.473 (0.476)</td>
</tr>
<tr>
<td>DegreesX Centralized</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EigenvectorX Centralized</td>
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<td>383.4*** (109.6)</td>
<td>152.8 (119.9)</td>
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<tr>
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<td>-0.000 (0.004)</td>
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<td>0.433* (0.217)</td>
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<td>0.032*** (0.005)</td>
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<td>0.144 (0.128)</td>
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<td>-0.046 (0.130)</td>
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<td>-0.037 (0.130)</td>
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</tr>
<tr>
<td>Leftist</td>
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<td>-0.012 (0.254)</td>
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<td>1.019*** (0.246)</td>
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<td>1.342*** (0.353)</td>
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<td>247</td>
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Note: +p<.1, *p<.05, **p<.01, ***p<.001

Standard errors in parentheses
<table>
<thead>
<tr>
<th>Targeted an Airport/airline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted a Business</td>
</tr>
<tr>
<td>Diplomatic Target</td>
</tr>
<tr>
<td>Education Target</td>
</tr>
<tr>
<td>Targeted Food/water supply</td>
</tr>
<tr>
<td>Targeted the Government</td>
</tr>
<tr>
<td>Targeted Journalists/Media</td>
</tr>
<tr>
<td>Maritime Target</td>
</tr>
<tr>
<td>Military Target</td>
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<tr>
<td>NGO Target</td>
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<tr>
<td>Police Target</td>
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<tr>
<td>Inflicted property damage</td>
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<tr>
<td>Religious target</td>
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<td>Telecommunications Target</td>
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<td>Targeted another Terrorist Group</td>
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<td>Targeted Tourists</td>
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<td>Targeted a Transportation System</td>
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<td>Targeted Utilities</td>
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<td>Bombing</td>
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<td>Shooting</td>
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<td>Hijacking</td>
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<td>WMD</td>
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</table>
APPENDIX E: FULL TRACES OF MODEL VARIABLES

Note: \( \mu_a \) and \( \mu_c \) are intercept terms. While they are not stable across simulations, their sum is, meaning that their instability does not affect coefficient estimates. Both are necessary because of variation within each intercept. They represent group-level and tactic-level fixed effects, and allow a given tactic or group to have a higher or lower propensity for adoption relative to other groups.

Figure E.1. Full Traces of Diffusion Model with Interactions. (continues several pages)
Figure E.1. (cont.)
Figure E.1. (cont.)
Figure E.1. (cont.)
Figure E.1. (cont.)
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