The Rise and Spread of Suicide Bombing

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Abstract

This article reviews the existing literature, mostly from political science, on suicide bombing. A prominent weapon in the toolkit of violent nonstate actors for a generation, suicide bombing generates a significantly larger number of casualties per attack than other uses of force by terrorist groups, insurgents, and others. Scholars tend to agree that no single reason leads individuals to become suicide bombers. Moreover, groups use suicide bombing for strategic reasons—although whether suicide bombing campaigns make groups more likely to achieve their goals is unclear. Scholars continue to disagree about what drives groups to adopt or eschew suicide bombing, including the role of religion. Although groups that are more religious are significantly more likely to adopt suicide bombing, the underlying cause and its relationship to particular religious ideologies (such as Salafi Jihadi movements) versus the structure of religious groups remain matters of contention.

INTRODUCTION

All academic fields simultaneously shape and respond to broader political, economic, and cultural trends. Political science in some ways uniquely adapts to the world around it because political and economic shifts in the world raise new issues to the fore while making others seem less important. To give just one obvious example, consider the decline of research on Russia within political science after the end of the Cold War. Understanding the political development, intentions, and trajectory of Russia had been one of the most important topics throughout the Cold War, not only in global politics but also for political science scholars. As the Soviet Union disintegrated into the Commonwealth of Independent States, however, research on those component states declined as well. Although many scholars still worked on the topic, rising scholars became less likely to study Russia, probably because it seemed less important in the world, and some Russia scholars moved on to focus on other topics. However, with Russia's actions in 2014, annexing the Crimea and launching attacks in eastern Ukraine, Russia is now back on the front burner of international politics, meaning scholarship will eventually follow.

The terrorist attacks of September 11, 2001, seemed like a bolt from the blue to most in the United States—and also for political science. In particular, the shocking decision of the 19 hijackers to fly airplanes into the World Trade Towers and the Pentagon, guaranteeing their deaths (and those of thousands of others), left many political scientists befuddled. Although terrorist research had been growing since the end of the Cold War, partly but not exclusively due to interest in the behavior of violent nonstate actors in the Israeli–Palestinian dispute and declining concern with interstate war, its prominence rose significantly after the 9/11 attacks. And nowhere was that clearer than in the dramatic growth in research on suicide bombing, the method used to execute the attacks.

More than a decade later, the literature on suicide bombing is arguably at a turning point. None of the dominant strands of research over the last decade, from the focus on occupation to outbidding to religious ideology, seem to fully capture the variety of incentives that lead violent nonstate actors to use, or not use, suicide bombing in their toolkit of violence. This lack of consensus is normal in the development of a research agenda, as knowledge aggregates over time, but it means that, absent a new theoretical approach or the development of additional data to test theories not currently amenable to systematic testing, the relative size of new contributions to scholarly knowledge on suicide bombing will likely drop.

Moreover, in the first several years after 9/11, the use of multiple, sometimes incompatible or conflicting datasets by scholars researching suicide bombing made the aggregation of knowledge more difficult. Over the last few years, many researchers analyzing suicide bombing have converged on the Global Terrorism Database (GTD) updated by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), based at the University of Maryland, but there are still many datasets on suicide bombing. More convergence is necessary to increase the comparability of results.

Finally, as the use of suicide bombing has become, unfortunately, a more regular occurrence since 9/11, including against US troops, allies, and partners in Afghanistan and Iraq, the novelty value of suicide bombing as a topic of research has faded. That is to say, suicide bombing has shifted from what was the equivalent of a military innovation for violent nonstate actors to a more "normalized" presence in the violent nonstate actor's toolkit. Similarly, over time, and in recognition of the way that many different types of nonstate actors employ suicide bombing, research on this tactic has increasingly faded into more general research on strategies of violent nonstate actors in terrorism, civil wars, and insurgencies.

Thus, more than a decade after the 9/11 attacks, it makes sense to think about the cumulative knowledge generated by scholarly research on suicide bombing and the key questions that remain. Despite what has often been a scattered field of research, some findings have stood out over time. First, rather than a decision made in the heat of the moment, the decision by violent nonstate actors to use suicide bombing appears strategic (rightly or wrongly). Whether the targets are military bases groups cannot hit without using suicide bombs, public spaces, or prominent landmarks, groups employ suicide bombing in support of particular ends, with adoption depending on an interaction between the desire and the capacity to use the tactic. Whether suicide bombing helps groups achieve their ends more than other tactics remains an open question, however.

Second, a significant relationship appears to exist between religious groups and the use of suicide bombing. The details of the relationship remain murky, however, and it is still unclear whether that relationship is due to a historical accident, e.g., the clustering of a particular set of conflicts likely to trigger the use of suicide bombing in the Islamic world; something about the ideology of particular groups, such as al Qaeda and other Salafi Jihadi groups; something about the way religious groups operate as exclusive clubs and regulate membership; or some combination of these factors.

Third, social networks appear to play a large role in predicting who becomes a suicide bomber and whether a group uses suicide bombing. Other explanations, including foreign occupation, the targeting of democracies, and group competition, have received inconsistent (or worse) empirical support. Additionally, although the organizational characteristics of suicide bombing adopters appear important, more research is needed to determine exactly what gives terrorist groups the organizational capacity to use suicide bombing.

This review article proceeds in four steps. First, using data on journal article and book publications, the article details the beginning and the trajectory of research on suicide bombing, including disputes about terminology. Second, the article lays out a framework for examining some of the dominant strands of research on suicide bombing and key findings that have emerged from this research. Third, the article describes some of the key limitations and shortcomings of research on suicide bombing, some of which are likely inherent to research focused on a particular tactic, rather than a broader phenomenon. Fourth, the article describes paths for research on suicide bombing moving forward.

WHAT IS SUICIDE BOMBING?

One challenge in assessing the development of literature on suicide bombing is parsing the various definitions scholars have used. The topic has been referred to as suicide terrorism, suicide missions, suicide bombing, and suicide attacks, among other phrases. This article purposefully uses the terms suicide bombing and suicide attacks interchangeably. Either term emphasizes the activity itself, which can be used by state actors (as Japan used kamikaze attacks in World War II) or nonstate actors, rather than classifying it as a form of terrorism. This helps move past the question of what constitutes a terrorist act, which remains controversial and difficult to define objectively. The term suicide mission is also used much less frequently in the literature.

A suicide bombing is most often defined as an attack where the death of the bomber is the means by which the attack is accomplished. This excludes attacks where the bomber's survival is extremely unlikely but is theoretically feasible. Whereas some earlier research only required an extremely high likelihood of death on the part of the bomber, most suicide bombing research has converged on the death of the bomber as a requirement for meeting a suicide bombing classification (Crenshaw 2007, p. 138; Pape 2005, p. 10; Pedahzur 2005, p. 8).

TRENDS IN SUICIDE BOMBING AND SUICIDE BOMBING RESEARCH

Prior to the 9/11 attacks, research on suicide bombing generally focused on three vectors. The modern suicide bombing era began in Lebanon in the 1980s; the first modern attack took place in 1981, followed by Hezbollah's infamous suicide attack against the US Marine Corps Barracks in 1983. Consequently, much of the research discussed Hezbollah (Atran 2003; Pedahzur 2005; Ricolfi 2005, p. 80; Shay 2004). Second, some scholars examined the role of suicide bombing in the Israeli-Palestinian dispute (Araj 2008, Pedahzur 2005, Ricolfi 2005, Weinberg et al. 2003). Researchers attempted to explain the use and effect of suicide bombing by violent nonstate actors such as Hamas and Islamic Jihad in Israel beginning in the mid-1990s.¹ In the Israeli–Palestinian context, suicide attacks seemed mostly perpetrated against civilians and represented a significant escalation of violence from the first Intifada (Crenshaw 2007, p. 147; Hafez 2006, p. 53; Ricolfi 2005). Yet, compared to the number of suicide attacks that occurred in Afghanistan and Iraq in the 2000s, the 114 suicide attacks conducted by Palestinian groups prior to 2002 now seems much smaller than it once did (National Consortium for the Study of Terrorism and Responses to Terrorism 2013).² A third well-studied actor was the Tamil Tigers, the most prolific adopter of suicide bombing prior to 9/11. According to the GTD data, the Tamil Tigers had conducted 69 suicide attacks as part of their struggle for independence in Sri Lanka through the end of 2001. The way this group utilized suicide bombing, however, was quite different from the Palestinian case. In contrast to the Palestinian case, where nearly all suicide attacks targeted civilians and were conducted by recently recruited members, the Tamil Tigers mostly used suicide attacks against harder military targets (or hard-to-reach civilian elites) and trained a specialized unit called the Black Tigers specifically to conduct the attacks (Bloom 2004, Hopgood 2005, Ramasubramanian 2004).

Figure 1 shows time-series data on suicide bombing drawn from the GTD that lays out the enormous growth in suicide bombing in the early 2000s, as it became what Acosta & Childs (2013, p. 50) call a "trendy fashion," followed by a decline starting in the late 2000s and then an uptick in recent years.³ This figure also shows that despite recent growth, suicide attacks as a percentage of all terrorist attacks remain below their peak in the mid-2000s.

The 9/11 attacks had a large effect on suicide bombing research. Google's Ngram Viewer allows researchers to search the books cataloged by Google, which number in the millions, using particular terminology. Searching for all books referencing the terms suicide bombing, suicide attacks, suicide mission, and suicide terror (including all derivatives, e.g., suicide bomb, suicide terrorism, suicide attack) reveals a dramatic growth in research on suicide bombing during the period 2001–2008 (Michel et al. 2011). From 2000 to 2003, references to suicide bombing, writ large, increased by almost 395% (**Figure 2**). That fourfold jump clearly demonstrates a growth in interest, though the rate of growth seemed to stabilize around 2008.

Viewing the extent of suicide bombing research through the lens of Google Scholar reveals a similar pattern. Figure 3 shows the results of the same search used to produce Figure 2, but done

¹Prior to 2002, according to GTD's data on suicide attacks, Hamas conducted 43 suicide attacks and Palestinian Islamic Jihad conducted 19.

²Note that even these counts can be controversial within the literature. GTD, Pape, and Pedahzur, to list three data sources, all have different totals [Chicago Project on Security and Terrorism (CPOST) 2014, National Consortium for the Study of Terrorism and Responses to Terrorism (START) 2013, Pedahzur 2005].

³The Chicago Project on Security & Terrorism, using a different coding methodology, argues that GTD undercounts suicide attacks. The overall trends are very similar across both datasets, however (Pape et al. 2014).

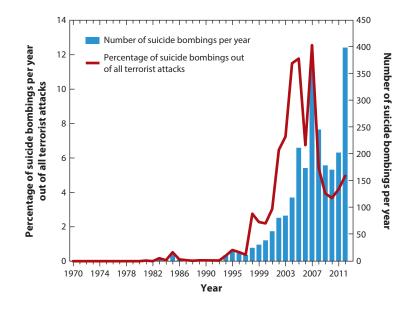


Figure 1

Change in the number and percentage of suicide bombings over time, 1970–2012. Source: National Consortium for the Study of Terrorism and Responses to Terrorism (2013).

in Google Scholar, covering the period 1999–2013. It clearly shows the significant expansion of research after the 9/11 attacks. However, despite the issues discussed below with regard to the aggregation of knowledge on suicide bombing in the literature, references to the topic have remained near peak levels through 2013.

What have scholars learned from this research on suicide bombing? The next section describes some of the major lines of argumentation and their key implications. In general, we can classify

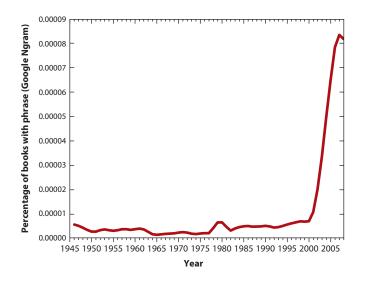


Figure 2

Change in percentage of books referencing suicide bomb(ing) or terror(ism)/attack(s)/mission(s). Moving average over two years, 1945–2008. Source: Google Ngram (Michel et al. 2011).

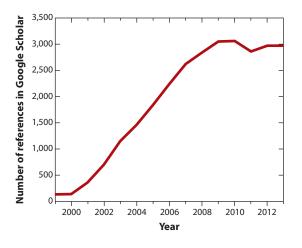


Figure 3

Change in references to suicide bomb(ing) or terror(ism)/attack(s)/mission(s), 1999–2013. Source: Google Scholar.

explanations by applying a modified version of the classic difference between the individual, the state, and the system (Waltz 1959). In this case, the relevant categories are the individual, the group/organization, and the society (this is similar in some ways to the distinctions drawn by Moghadam 2006a), with many explanations crossing boundaries between these different focal points.

EXPLAINING SUICIDE BOMBING

Why Do Individuals Commit Suicide Attacks?

One line of research involves trying to determine who, at the individual level, conducts suicide attacks. Part of the initial reaction to suicide bombing in the scholarly community was an assumption that those who choose to blow themselves up must be making an irrational decision (for a discussion, see Crenshaw 2007). Why would perfectly healthy and rational people, after all, choose to kill themselves? These explanations have lost favor, with most scholars arguing that suicide bombers are not irrational but decide to become suicide bombers for a variety of social, organizational, economic, religious, and other reasons (Gambetta 2005a). In fact, Azam (2005, p. 179) models suicide bombing as a type of intergenerational wealth transfer, where suicide bombers attempt to protect more wealth for future generations by making sacrifices today. From a religious perspective, Bernholz (2004) posits that acts of terror are rational acts to uphold the supreme values of the group. Merari (2012) draws on interviews with arrested would-be suicide bombers in Israel to argue that suicide bombers exhibit the characteristics of depression, but Brym & Araj's (2012a,b) interviews with the families and friends of Palestinian suicide bombers suggest that suicide bombers do not demonstrate levels of depression higher than one would expect in the general population.

Even if some of the psychological claims were true, they would not speak to the issue of individual motivation. In contrast to the Black Tigers in the Sri Lanka case (a highly trained cadre of operatives), many organizations draw in suicide bombers specifically for a particular attack. Religious and/or nationalistic commitments to groups, the desire for revenge against occupiers,

indoctrination, social networks, and other factors appear to motivate suicide bombers (Crenshaw 2007). This research leaves a general conclusion similar to Pedahzur's (2005): Suicide bombers tend to come from many different types of communities and from different situations, making individual-level generalizations difficult.

One recent claim concerning an individual psychological motivation for suicide bombing comes from Lankford (2011, 2014). He argues that suicide bombers demonstrate psychological tendencies associated with suicide, although difficulties in finding enough evidence to actually psychologically evaluate suicide bombers post hoc makes drawing inferences difficult. Moreover, given that individual-level evidence gathered by most other scholars seems to contradict the assessment of suicide bombers as literally suicidal, the evidentiary bar for this argument to cross is very high.

Another piece of this literature, though also related to sociocultural and organizational explanations, relates to the phenomenon of female suicide bombers. Brought into the public eye by the "Black Widows" group in Chechnya, female suicide bombers have received growing attention from terrorism scholars in recent years (e.g., see Bloom 2010, 2012; Conley 2004; Skaine 2006). The recruitment and use of women by terrorist and other violent nonstate actors have varied across time and space, although the general trend has been toward an increasing use of women for attacks, even in more patriarchal societies. Bloom (2012) argues that female participation in terrorist activities, especially as suicide bombers, is often willful and complex (rather than simply resulting from coercion by men), driven by the same sorts of motivations that cause men to become suicide bombers. One reason why the use of female suicide bombers has been on the rise, according to Davis (2013) is the need for jihadi groups to recruit more suicide bombers. Female suicide bombers also have the ability, at times, due to societal stereotypes, to help terrorist groups achieve tactical surprise by getting into places where a male suicide bomber might be suspected and detained prior to setting off the bomb (Davis 2013, p. 287).

Why Do Groups Adopt Suicide Bombing?

Most research on suicide bombing has taken place at the level of the group, investigating why groups use (or do not use) this tactic. As the early literature on suicide bombing grew out of interest in the Israeli–Palestinian case and then the 9/11 attacks, many scholars began studying the phenomenon by asking why groups use suicide bombing.⁴

A group's decision about whether to use suicide bombing can be considered as part of a broader relationship between opportunity and willingness that influences many other tactical decisions, from the use of suicide bombing or kidnapping or hijacking to the types of targets to attack. Adoption depends on a group having the organizational capacity to use suicide bombing, as well as the desire to adopt it (Horowitz 2010a). Research on suicide bombing has tended to assume the rationality, at the group level, of the decision to use the tactic. Although scholars disagree about whether groups use suicide bombing as a last resort when they cannot achieve either tactical or strategic goals in any other way (Crenshaw 2007, Hoffman & McCormick 2004, Pape 2005), most think of it as a strategic choice by a group.

The organizational decision to use suicide bombing makes most sense, of course, if the use of suicide bombing makes group success more likely. Pape (2005, p. 65) argues that groups employing suicide bombing achieve success rates of over 50%. Although presumably that would be much higher than the success rates of groups using other tactics, Pape did not attempt comparison.

⁴From a methodological perspective, this led to an overweighting, in some ways, on the question of what drives groups to use suicide bombing, with much less attention to why the vast majority of violent nonstate actors, historically, have not used suicide bombing.

Moreover, subsequent research demonstrated that Pape's definition of success was too broad. Moghadam (2006b, p. 715) shows, for example, that the real success rate at the time Pape originally wrote was more like 4 out of 17 suicide bombing campaigns, or 24%. Further research also highlights the difficulty that even relatively powerful terrorist groups have in achieving their goals (Abrahms 2006).

Yet success can be defined more broadly than achievement of terminal goals such as toppling a government, ejecting an invader, or controlling territory. Success, in the context of violent nonstate actors, can be simply staying alive. Violent nonstate actors are under constant pressure they exist because of their willingness to use violence against states, for the most part. Some of the suicide bombing literature suggests that success can also involve signaling to governments or the public the group's willingness to continue fighting by demonstrating the costs that it is prepared to pay, including the death of its own members (Bloom 2005, Hoffman & McCormick 2004). Within this literature, several explanations at the group-level stand out as influencing the incentives of groups to adopt suicide bombing.

Occupation. Pape's prominent research (the most highly cited in the literature on suicide bombing) in the last decade suggested that suicide bombing was a result of foreign occupation (Pape 2003, 2005; Pape & Feldman 2010). Groups turned to this tactic as a way to raise the costs to the occupier and raise the media profile of their struggle, attempting to coerce the occupier into leaving. Pape further argues that democracies were uniquely vulnerable to this type of coercion, meaning democratic occupiers were most likely to suffer from suicide attacks.

The initial research on occupation suffered, however, from selection on the dependent variable (Ashworth et al. 2008). By only looking at those groups that used suicide bombing, initial research on the relationship between occupation and suicide bombing failed to account for the possibility that occupation was not a driver of suicide bombing, per se, but of all types of violent resistance to occupation. This made it impossible, from a methodological perspective, to establish a causal relationship between foreign occupation and suicide bombing. Indeed, cases such as the Provisional Irish Republican Army (PIRA), which did not adopt suicide bombing despite the perception of occupation by the British, and many other nonadopters among European terrorist groups, demonstrated that occupation is statistically more related to violent resistance than to suicide bombing in particular (Horowitz 2010b, Moghadam 2006b, Piazza 2009).

Another issue is that the definition of foreign occupation in these studies is far from consistent. Expansive definitions including the placement of military bases by a foreign power, or even less militaristic activities, can make just about anything look like foreign occupation, undermining the robustness of the results (Atran 2006, Moghadam 2006b). Moreover, several examples of the adoption of suicide bombing since 9/11, including in Bangladesh and Turkey, seem entirely unrelated to a reasonable definition of foreign occupation. In particular, having examined all country-years from 1980 to 2003, thereby correcting for the problem of selection on the dependent variable, Jackson Wade & Reiter (2007) find no relationship between democratic occupiers and suicide bombing.

Recent research does suggest that the link between occupation and suicide bombing may not be entirely spurious. Using the group as the unit of analysis, Braun & Genkin (2014) find a positive relationship between occupation and the adoption of suicide bombing. Piazza (2009) shows that although the link between democracy and suicide bombing is not robust, occupation does make suicide bombing, as opposed to other types of terrorism, more likely.

Group competition (outbidding). Another prominent explanation for the adoption of suicide bombing by groups is that competition between groups for followers, especially within small geographic regions, leads them to demonstrate their commitment to the cause through violence.

Given that suicide bombing definitionally involves a member of the group losing his or her life, it is an extremely strong demonstration of commitment. Thus, Bloom (2004, 2005) and others argue that the adoption of suicide bombing often results from a process of "outbidding" between groups (also see Kydd & Walter 2002, 2006). Rather than thinking of suicide bombing as a direct weapon for coercion of the state (as Pape conceptualizes it), Bloom and others think of suicide bombing as domestic political signaling (Crenshaw 2007, p. 145). The best example of outbidding processes seems to come from the Israeli–Palestinian dispute. Bloom and others highlight attempts by groups such as Hamas and Islamic Jihad to gain "market share" by demonstrating to the Palestinian population their commitment to the cause through suicide bombing (for more supporting evidence, see Gupta & Mundra 2005).⁵

Broader empirical results concerning the outbidding argument are more mixed. Findley & Young (2012), evaluating all terrorist activities during 1970–2004, find that the presence of multiple groups in a geographic space, a key trigger for outbidding, does not make the adoption of suicide bombing more likely. In contrast, research on the survival of terrorist groups more broadly does find strong evidence that group competition dynamics exist. Research by Young & Dugan (2014) shows that as the number of terrorist groups in a given area increases, the probability of survival by any individual group decreases.

Dependence on public opinion. As mentioned in the Introduction, one of the issues that confronted early work on suicide bombing was the almost exclusive focus on groups that decided to use suicide bombing. An equally important question is why, given its potential effectiveness, more groups do not use suicide bombing. Kalyvas & Sánchez-Cuenca (2005) provide one answer, explaining that whether groups use suicide bombing depends in large part on their relationship to the public that would be most directly affected by the attacks. Groups that are either completely disconnected from the public or have the support of the public can employ suicide bombing without fear of consequences from a public backlash, whereas other groups have to be more careful. This is one of the most intuitively appealing arguments in the literature, and it is consistent with organizational and religious explanations, among others. However, there are at least some examples, such as the Liberation Tigers of Tamil Eelam, of groups that seem to be in that "middle" space and therefore unlikely to use suicide bombing but have in fact adopted it. Exploring the Kalyvas & Sánchez-Cuenca line of argumentation is a promising avenue for future research, although developing a measure to systematically evaluate the dependence of groups on a local public will be challenging.

Religion. Perhaps the most discussed aspect surrounding the adoption of suicide bombing is the role of religion. In the aftermath of the 9/11 attacks, commentators immediately seized on the fact that the 19 hijackers were members of al Qaeda, meaning they were Salafi Jihadis. Given that prominent previous adopters of suicide bombing included Islamic (though not Salafi) groups such as Hezbollah and Hamas, this observation led scholars and others to ask whether Islamic groups, or perhaps religious groups more generally, were more likely to adopt suicide bombing.

One of the most robust findings in the suicide bombing literature is a positive correlation between religion, defined in many different ways, and the adoption of suicide bombing, although the underlying causal mechanism varies widely. Three explanations predominate. First, as part of his overall argument about occupation, Pape (2005, p. 88; Pape & Feldman 2010) argues

⁵Brym & Araj (2008) critique what they view as monocausal theories of suicide bombing, including outbidding, arguing that several factors motivate the decision by groups to employ suicide bombing.

that religion itself is unrelated to the adoption of suicide bombing, but that religious differences between a group and the target do make adoption more likely, because religious differences can "inflame" nationalist sentiment.

Berman and Laitin, in contrast to Pape, find that religious groups are much more likely to adopt suicide bombing in general, although their argument is unrelated to the theology of religiously motivated groups per se (Berman 2009, Berman & Laitin 2008). Instead, they extend the "club" model of religious groups from economics and sociology to terrorism (Iannaccone 2006, Iannaccone & Berman 2006) and argue that extreme religious groups are more likely to adopt suicide bombing as a result of intragroup dynamics (Berman 2009, pp. 43–45; Berman & Laitin 2008). Extreme religious groups that provide social services, in particular, both have a universal claim on their members and face the risk of a suboptimal distribution of resources if soft supporters are allowed to remain in the club. The possibility that members might have to sacrifice themselves as suicide bombers serves to weed out soft supporters. The strength of ties in high-commitment religious clubs, combined with the incentives that make defection by individuals less likely, also facilitates the careful planning and secrecy necessary to implement suicide attacks (Berman 2009, p. 174).

Alternatively, for Hoffman (2004), Moghadam (2009), and others, adoption is at least in part due to the theology of Salafi Jihadis themselves, which facilitates the spread of the tactic and the globalization of suicide campaigns. According to Moghadam (2009, pp. 78–85), in particular, "martyrdom operations" are a central element of al Qaeda's ideology, and a series of extreme theologians have used selective readings of the Qur'an to make the use of suicide bombing a critical element of Salafi Jihadi attacks. Relatedly, the existence of al Qaeda as a critical node in a network of violent nonstate actors around the world also facilitated the spread of suicide bombing (Horowitz 2010a).

These distinctions demonstrate another area where future research on suicide bombing could emerge. If Berman and Laitin are correct, for example, one testable implication is that more intensely religious groups are more likely to adopt suicide bombing regardless of the particular religion. Alternatively, if those more focused on Salafi Jihadi groups are correct, Salafi Jihadi groups could be more likely to adopt suicide bombing, all other things equal, even in comparison to other religious groups. Of course, in the real world, all other things are rarely equal, which will make causal inference difficult. However, nailing down the mechanism that explains the correlation between suicide bombing and religious groups should be a priority for future scholarship.

Organizational characteristics. A final area of research looks at organization-level characteristics that influence whether groups adopt suicide bombing. One way to think about suicide bombing is as a special case of a military innovation—a military innovation for violent nonstate actors. This perspective adds the notion of organizational capacity to the other characteristics described above, which focus almost exclusively on the willingness to adopt or incentives to adopt. The specialized training involved can make suicide bombing difficult to adopt for violent nonstate actors, particularly ones that developed organizational routines and nonsuicide ways of using force prior to the beginning of the suicide bombing era. Like national militaries considering whether to adopt new military innovations (combinations of technologies and organizational practices for using those technologies), violent nonstate actors set in their ways are likely to struggle when adopting new innovations such as suicide bombing. Evaluating terrorist groups active from the 1970s through 2006, both those that adopted suicide bombing and those that did not, Horowitz (2010a,b) finds that younger groups—those less set in their ways—are more likely to adopt suicide bombing.

Of course, age is simply a proxy for organizational capacity. Other organizational factors, though very difficult to measure, certainly could be significantly related to suicide bombing. Larger

organizations, for example, could be more able to absorb the costs of losing a member through a suicide attack, and they should be more competent, since they have survived and grown (for more on organizational size and group behavior, see Asal & Rethemeyer 2008). Gilli & Gilli (2014) argue that organizational size, rather than age, is a better test of whether organizational factors predict the adoption of suicide bombing. Two issues with this analysis require further investigation. First, by mistaking Horowitz's argument about Olson (1982) and bureaucratic sclerosis for a wholesale importation of Christensen's (1997) disruptive innovation theory, Gilli & Gilli understate the potential utility of organizational age as a measure. Moreover, Gilli & Gilli's (2014) measure of organizational size does not take into account the likely nonlinear relationship between size and the capacity to adopt suicide bombing. This potentially calls into question their finding that organizational size is either unrelated or linearly positively related to suicide bombing adoption. Truly small organizations simply lack the organizational infrastructure to use suicide bombing; it would eliminate too much of their organizational capital. Only organizations above a certain size threshold can adopt suicide bombing. Using a more appropriate, threshold-based way of evaluating organizational size reveals that groups just below the largest size are more likely to adopt suicide bombing than the largest terrorist groups (Horowitz 2015). More data gathering on organizational size is necessary, however, as well as more theorizing on the link between size and suicide bombing adoption. Especially as the "normalization" of suicide bombing continues and it ceases to be a new innovation, overall group competence may become associated with adoption.

How Do Societal Factors Influence the Adoption of Suicide Bombing?

Organizations do not make decisions in a vacuum. They exist in a broader geographic space, as the outbidding argument describes, as well as in a broader information space. One line of research on suicide bombing involves understanding its spread from the early 1980s, when the use of suicide bombing was limited to a few groups and instances (the best-known being Hezbollah in Lebanon), to the present, when dozens of groups use suicide bombing around the world. Expertise in suicide bombing could be spreading through both direct connections, where groups communicate with each other or even ally with each other (Asal & Rethemeyer 2008, Horowitz & Potter 2014), and indirect connections, where groups learn through observing the behavior of other groups. One infamous example of indirect diffusion is the suicide vest, an innovation by the Tamil Tigers whose description in the media facilitated its spread to terrorist groups around the world.

Socioeconomic status. Initially, many suspected that suicide bombings might be more likely among less well-off individuals and societies. Those individuals, presumably with less invested in the status quo, would be more likely to be willing to kill themselves. Stories of Iraqi leader Saddam Hussein giving up to \$25,000 to Palestinian families of suicide bombers furthered this impression (Yang 2002). Rosendorff & Sandler (2010) also show that individuals are more likely to join terrorist groups when the benefits outweigh their exogenous economic opportunities. Moreover, the countries likely to produce suicide bombers are those that tend to be relatively impoverished. Yet early empirical work on the topic suggested no relationship existed between poverty and the decision to become a suicide bomber. In fact, suicide bombers tended to come from slightly higher levels of socioeconomic status within their society (Krueger 2007, Krueger & Maleckova 2003).

Other research provides an explanation for the seemingly contradictory findings that poverty is positively related to a country producing suicide bombers but unrelated to being a suicide bomber. The key is that poor economic conditions such as high unemployment can create incentives for groups to use suicide bombing (Santifort-Jordan & Sandler 2014), but suicide bombing is often

used against hard targets or in higher-impact missions where complex activities are necessary to ensure success. Thus, terrorist groups, when selecting suicide bombers from a potential candidate pool, tend to select those with high levels of education, who are viewed as more likely to be able to execute a difficult mission. Bueno de Mesquita (2005) provides theoretical evidence in favor of this proposition, and Benmelech et al. (2012), evaluating Palestinian suicide bombers from 2000 through 2006, find empirical support for the relationship. In particular, Benmelech et al. (2012) find that as societal poverty increases, the ability of violent nonstate actors to recruit more qualified (e.g., better educated, higher socioeconomic status) suicide bombers increases. Those more qualified bombers are also less likely to fail at their missions (Benmelech & Berrebi 2007). Relatedly, Gambetta & Hertog (2009) find that the overrepresentation of engineers and those with elite degrees in the pool of suicide bombers relates to weak economic opportunities in those career areas in the Middle East, which increase their relative perception of deprivation and make radicalization more likely.

Regime type. Pape's (2003) research on occupation and suicide bombing, combined with the initial focus on the Israeli–Palestinian case, led some toward the initial conclusion that there was a significant relationship between regime type and suicide bombing, with democracies or democratic occupiers more likely to experience it. Focusing on the country-year as the unit of analysis, subsequent analyses have found either no relationship between democracy and suicide bombing (Braun & Genkin 2014, Jackson Wade & Reiter 2007, Piazza 2008) or a negative relationship (Santifort-Jordan & Sandler 2014). After all, for the same reason that democracies are less likely to experience terrorism—the democratic process provides venues for citizens to air their grievances short of the use of force—suicide bombing in democracies is less likely. Piazza (2008) finds that terrorists from nondemocracies are actually more likely to use suicide bombing.

Networks. Another reasonably robust finding in the literature is that networks play a role at both the local and global levels in facilitating the diffusion of suicide bombing over time. At the local level, individuals tend to become suicide bombers through complex social network processes. Horizontal networks facilitate recruitment across families, friends, and groups (Pedahzur & Perliger 2006, p. 1,989; Sageman 2004). Religion can be a unifying point through which that networking occurs, although its role, in this case, is not necessarily causal. Empirically, Pedahzur & Perliger's (2006, p. 1,995) social network analysis of Palestinian suicide bombers highlights the way that key network "hubs" drove recruiting and selection of suicide bombers by Palestinian groups in the 1990s and early 2000s.

At the international level, between groups rather than individuals, social networks similarly seem to help drive the spread of suicide bombing. Horowitz (2010a) shows how the large number of connections that Hezbollah and al Qaeda, respectively, had to other groups helped speed the diffusion of suicide bombing. This is consistent with Moghadam's (2009) argument, described above, about the "globalization" of martyrdom through Salafi Jihadi networks. Al Qaeda and its affiliates stand out in this network, playing a prominent role in diffusing suicide bombing knowledge to partner groups and theological-affinity groups (Acosta & Childs 2013, Hoffman 2006, Moghadam 2009). Acosta & Childs (2013), using newly developed time-series data on links between terrorist groups, also find a positive and significant relationship between network ties among groups and the spread of suicide bombing. Moreover, the use of suicide bombing itself generates a snowball effect of mimicry and more future adopters (Acosta & Childs 2013, p. 65).

IS THE CHARACTER OF SUICIDE BOMBING CHANGING?

From its modern "invention" in Lebanon in the early 1980s through the early 2000s, following the 9/11 attacks, suicide bombing was an extremely innovative technique used by a small number of terrorist groups in a relatively small number of attacks. For this period, which drove the development of many of the theories described above, more localized theories of suicide bombing appear most persuasive. In addition, it is in this early period that suicide bombing really was an innovation—similar to others in world history, but primarily for nonstate actors. Adoption of suicide bombing was difficult during this period, especially for groups that had previously come of age, with publics unaccustomed to the technique and significant organizational investments made in keeping their personnel alive.

The use of suicide bombing then accelerated, both in terms of raw totals and as a percentage of all terrorist attacks, from 2002/2003 onward. Two reasons likely explain this jump. First, the use of suicide bombing by prominent groups such as Hamas and al Qaeda helped make it trendy, and the network ties of al Qaeda in particular sped its diffusion (Acosta & Childs 2013, Moghadam 2009). Second, the invasions of Afghanistan in late 2001 and Iraq in 2003 by the United States and its allies, especially given the growing prominence of suicide bombing and the growth of Salafi Jihadi movements in Iraq, led to a dramatic growth in the use of suicide bombing by violent nonstate actors opposed to the new governments. In this period and beyond, suicide bombing has seemingly become normalized—a regular tool in the toolkit of violent nonstate actors. And as knowledge about best practices concerning the use of suicide bombing spreads, the barriers to adoption lower for groups incentivized to use suicide bombing.

Put another way, over the last decade, suicide bombing has developed from being a relatively new technology used by what, in retrospect, were early adopters, to reaching maturity as an innovation. In the S curve that scholars use to study the spread of things from microwave ovens to aircraft carriers (Rogers 2003), suicide bombing now appears in a more stable place, with plenty of diffusion around the world. And as suicide bombing continues to become a more regular part of the toolkit for violent nonstate actors, the theories relevant for explaining its continuing spread may change as well. The theories that helped explain the spread of battleships at the outset of the twentieth century appeared less relevant in the 1930s, when nearly all even medium-sized navies possessed steel, all-big-gun battleships. The same may become true about suicide bombing, and a new generation of theorizing may be necessary to understand how it continues to evolve and spread over time.

CONCLUSION

As should be clear from the discussion above, the literature on suicide bombing is diverse, with some of the most prominent hypotheses receiving mixed empirical support (or worse). One interesting question involves the role of religion. As described above, there is clearly some relationship, at least according to the evidence up to this point, between religion and suicide bombing. The causal logic of the argument remains an open question, however. Whether the explanation for the relationship lies in religious differences between user and target, religious clubs seeking to efficiently distribute goods, or Salafi Jihadi ideology/theology, it will require further research to tease out the details. The disproportionate adoption of suicide bombing by Islamic extremist groups could be due to something about ideology/theology, but it could also be due to network effects (that is simply the network where the innovation occurred) or something else. Designing future research to identify these mechanisms is potentially a promising path for scholars.

Another important future question is understanding what is unique about suicide bombing in comparison to other terrorist tactics. Many of the explanations for suicide bombing might also

apply to other ways that violent nonstate actors use force. Most prominently, as described above, Pape's (2003) research on occupation and suicide bombing obscured the fact that occupation was related to many different forms of violent nonstate behavior, rather than suicide bombing in particular.

Future research could evolve to tackle challenges related to the relationship between suicide bombing and other tactics in at least two ways. First, more research comparing the use of suicide bombing to the use of other terrorist tactics could help scholars more productively understand what is unique about the decision to use suicide bombing—and what is not (Crenshaw 2007, p. 160). Second, as described above, we now have a series of theories laying out when violent nonstate actors are more likely to use suicide bombing. Testing those theories on other uses of force by violent nonstate actors could also offer a productive way toward developing more useful models of terrorist group decision making concerning when and how they use violence.

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