

# Strategic Substitution and Complimentarity in the Israel-Palestine Conflict

Aaron Clauset<sup>\*,†</sup> Lindsay Heger<sup>‡</sup>  
Maxwell Young<sup>•,†</sup> Kristian Skrede Gleditsch<sup>◦,\*</sup>

<sup>\*</sup>Santa Fe Institute, 1399 Hyde Park Rd., Santa Fe, NM 87501 USA

<sup>†</sup>Department of Computer Science, University of New Mexico, Albuquerque, NM 87131 USA

<sup>‡</sup>Department of Political Science, University of California San Diego, La Jolla, CA 92093 USA

<sup>•</sup>Department of Computer Science, University of Waterloo, Waterloo, Ontario N2L 3G1 Canada

<sup>◦</sup>Department of Government, University of Essex, Wivenhoe Park, Colchester CO4 3SQ UK

<sup>\*</sup>Centre for the Study of Civil War, Oslo, Norway

## Abstract

Terrorism is one of many possible tactics to which actors may resort in political conflicts; however, previous studies of the strategic substitution within terrorism have primarily focused on shifts in attack modes following government countermeasures. Yet, the decision to resort to specific violent tactics can be highly complex, and will typically also depend on number of factors other than government countermeasures. In this paper, we use the Israel-Palestine conflict as a case study to understand the strategic dynamics of violent conflict and their political context. We show strong empirical evidence that factors such as public support and inter-group competition, the anticipation of countermeasures, and nontrivial non-violent political payoff have an observable effect on the behavior of terrorist groups. We further cast these results in a more general framework of innovation, imitation, competition and dependence, which can be applied to other prolonged conflicts where we observe terrorist tactics, such as Northern Ireland, Colombia and Sri Lanka.

## 1 Introduction

Terrorism is a tool often employed by groups that have a disadvantage when engaging in conventional conflict with their adversaries, and its strategic character is clear from the behavior and declarations of prominent organizations that make use of such tactics. For example, in a statement made on 10 January 2003, Hamas founder Sheik Ahmed Yassin asserted the strategic value

of suicide attacks, arguing that “Iraq could win if it equipped its citizens with explosive belts and turned them into human bombs.” Similarly, on Friday March 26th, 2004 Hamas organizer Osama Hamdan instructed allied organizations that

The lone suicide martyr method has scored great achievements, but now, as we stand at the threshold of a decisive stage, we must resort to a tactic that brings us the desired results; I therefore tell you not to hurry to exact revenge. We have to be sure our assault is concerted and perfectly orchestrated. Don't waste resources and manpower on small operations.

Despite these and similar assertions that terrorist attacks are calculated, strategic decisions, there is still relatively little research that directly considers under what conditions groups may resort to terrorist attacks, what tactics they might use, and how they might respond to internal or external events in light of their strategic goals. Moreover, previous research on terrorism – in line with a more general trend in conflict studies, which includes work on strategic substitution – has tended to focus exclusively on the incidence of violence rather than its specific forms (e.g., hostages, arson, etc.) or its severity (i.e., the number of casualties). By looking at conflict incidence alone, this body of work implicitly assumes that all violent incidents essentially convey the same information about a group's strategy and goals. But clearly terrorism comes in many forms, and differences in the degree of severity matter (Clauset et al. 2007). The political impact of severity is illustrated by how the severe and very salient attacks of 11 September 2001 in New York and the 7 July 2005 bombings in London stimulated much more dramatic political and economic responses than incompetent attacks such as Richard Reed's shoe-bombing attempt, or the London copy-cat attacks of 21 July 2001.

A long-term goal of modern terrorism research has been to produce accurate predictions about the likelihood of violence both worldwide and in specific theaters, and about the political and strategic factors that contribute to its incidence. However, many fundamental questions about the strategic character of terrorism have received relatively less attention, and our models of terrorist behavior often omit these considerations, as a result. This situation may be due, in part, to the

aforementioned emphasis on attack incidence. When strategic factors are considered, studies focus on tactical substitutions driven by government counter-terrorism actions. Thus, many important questions beg for further study; What factors influence the character of terrorist violence, e.g., does politically engaging extremists promote more frequent, or more severe, terrorist attacks? Under what conditions will a terrorist organization favor lethal attacks over less severe tactics? How are strategic innovations in terrorism developed, and under what conditions can we expect such innovation to occur, e.g., do violent groups learn from each other? Developing more accurate answers to such heretofore unanswered questions of strategy is likely to significantly improve our understanding of, and ultimately our predictive power for, terrorist activity.

Frustratingly these large gaps in our understanding of terrorist violence can, and likely do, lead to ineffective government countermeasures, in which scarce resources are used to protect targets that are unlikely to be attacked, and unnecessary efforts are made to protect targets from tactics that groups are unlikely to use. Furthermore, in some cases, such countermeasures may be counterproductive toward the goal of resolving the underlying conflict.

Further, the emergence of innovative forms of terrorism, such as suicide attacks, car bombings, and the brutal hostage-takings recently seen in Iraq, Israel, Colombia and elsewhere, only highlights the importance of developing more accurate conceptual and quantitative models of terrorist behavior and of the strategic choices made by these groups.

Previous efforts to address the question of strategy have tended to focus on the phenomenon of strategic substitution (Landes 1978; Enders and Sandler 1993, 2004), and have shown that groups may switch attack modes when a state's counter-terrorism actions increase the cost of a popular mode of attack relative to alternative modes. For instance, by fitting a vector autoregression model to the attack-mode frequencies that bracketed the introduction of metal detectors in U.S. airports, Enders and Sandler (1993) provide good evidence that this counter-terrorism measure decreased the frequency of airplane hijackings, but also increased the incidence of other kinds of hostage situations. This model-centric approach, however, relies on significant assumptions about

terrorist behavior, and only focuses on how groups respond to the state's actions. A more realistic model would necessarily incorporate additional factors, such as the group's financial stability, its recruitment concerns, inter-group competition and coöperation, changes in its public support, its opportunities for non-violent political progress through mechanisms such as elections, and its ability to achieve its long term political goals.

Partially because the scarcity of high-quality data can make complex models of strategic decision-making difficult to validate, and partially because we take for granted that the calculus of terrorism is highly complex, in this paper, we employ a data-centric (or: model-agnostic) approach to assessing the importance of many of the factors mentioned above. By focusing our attention on those characteristics of a conflict<sup>1</sup> that are observable, i.e., a quantifiable and measurable, we find that several clear conclusions about strategic substitution and complementarity can be drawn from empirical data alone. Further, we note that these empirical findings point to new aspects of violent conflict that may be amenable to subsequent modeling efforts. For concreteness, we primarily focus our efforts on the last 12 years of the Israeli-Palestine conflict, and examine characteristics such as the frequency and severity of several kinds of violent terrorist attacks with respect to their timing. In particular, we find that factors such as inter-group competition and the degree of public support seem to have a strong influence on the character of Palestinian violence, often simultaneously. The following sections explore these factors in more depth. In the conclusion, we discuss the relevance of this study to other protracted conflicts encompassing terrorist attacks in Sri Lanka, Colombia, and Northern Ireland, and give several generic principles of the character of terrorist violence and its strategic components.

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<sup>1</sup>Many potentially important factors such as the financial stability of a group and its recruitment concerns are largely hidden from quantitative analysis because data on these topics is scarce, of poor quality, or non-existent. In many conflicts, even the most basic data on the public support of terrorist activities do not exist. In short, all work in this area would be improved by more and better data.

## 2 The Israel-Palestine Conflict

The Israeli-Palestinian conflict is an ideal conflict through which to examine substitution and complementarity in terrorist tactics for several reasons. First, it offers a unique opportunity to evaluate the effects of inter-group competition, as well as the impact of counter-terrorist efforts, public support, elections, and the strategies of Palestinian groups. Moreover, the Israeli-Palestinian conflict has given rise to a high share of recent terrorist events worldwide.<sup>2</sup>

We begin with a brief overview of the conflict, focusing on the current situation in the territory of Israel/Palestine, as opposed to the extra-regional extensions of the conflict, such as the 1972 Black September incident where Palestinian militants held Israeli athletes hostage in a third country. Our review will necessarily be selective, and we refer the interested reader to Gerner (1994) and Bickerton and Klausner (2004) for more comprehensive overviews.

Although there has been conflict over the territory currently known as either Israel or Palestine since antiquity, the modern Israel-Palestine conflict began in 1947 with the creation of the state of Israel and the failure of United Nations General Assembly Resolution 181 to divide the territory in an Arab and a Jewish part.<sup>3</sup> Unlike other struggles for autonomy, the Palestinian side has not coalesced into a vertically organized, state-like institution, under the leadership of one dominant organization. Instead, the Palestinian side of the conflict consists of many distinct organizations, which share a loose ideological or political bond, and often have a complicated historical and political relationship with each other.

The umbrella organization known as the *Palestine Liberation Organization* (PLO) was set up at the initiative of other countries in the Arab League in 1964. It includes a large number of

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<sup>2</sup>As an estimate of this fraction, consider that fully 3,017 (10.6%) events in the MIPT terrorism database (2006) were located in Israel or the Palestinian territories, out of a total 28,445 events worldwide since 1968. The share of Israeli-Palestinian events that caused at least one casualty is 1,057 (8.3%) out of 12,726.

<sup>3</sup>Terrorism in this region precedes the establishment of the state of Israel, as Jewish groups such as Irgun Tsvai Leumi used terrorist strategies to force the UK to give up control over the territory of Palestine. These Jewish groups drew inspiration from the Irish Republican Army, and their strategies in turn served as an inspiration for subsequent groups who resorted to terrorism, such as the National Organization of Cypriot Fighters (EOKA).

organizations, and has no centralized leadership. The PLO was never a coherent organization, and the Palestinian side has become increasingly fragmented following disagreements over the Oslo agreement, the idea of a two-state solution, and whether to engage in negotiations with the Israeli side more generally. The largest faction *Fatah* has been dominant since 1969, and has a largely secular orientation. Traditionally, Fatah has emphasized conventional armed struggle and guerrilla warfare against Israeli military targets, and, more recently, negotiations with the Israeli government. Since the start of the so-called *Second Intifada* in 2000, however, a group closely connected to Fatah known as the *Al-Aqsa Martyrs' Brigades* have carried out numerous terrorist attacks against civilians.<sup>4</sup> The second largest faction of the PLO, the *Popular Front for the Liberation of Palestine* (PFLP) has a Marxist orientation, and at one point left the PLO. It has rejected the Oslo agreement, and has generally been skeptical of negotiations with Israel. The PFLP carried out numerous airplane hijackings in the 1960s and 1970s, but has recently switched to attacks against civilians in Israel. The increasingly prominent *Hamas* movement, formed in 1987 in opposition to the Oslo agreement, seeks to create an Islamic republic. Hamas has never been part of the PLO, and rejects a two-state solution and recognition of Israel. Hamas has emphasized the provision of social services in the occupied territories, but has also engaged in terrorist attacks, and was the first group in this conflict to use suicide attacks in 1993. Another group not affiliated with the PLO that has engaged in terrorism on the Palestinian side is the *Palestinian Islamic Jihad* (PIJ), which has links to Hezbollah in Lebanon and is believed to be supported by Iran.

Having introduced the main actors, we now turn to some descriptive statistics on the use of terrorism in the Israel-Palestine conflict. We draw our terrorist incident data from the National Memorial Institute for the Prevention of Terrorism (2006), which provides the event date, target, city (if applicable), country, type of weapon used, terrorist group responsible (if known), number of deaths (if known), number of injuries (if known), as well as a brief description of the attack and

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<sup>4</sup>The Second Intifada, also known as the Al-Aqsa Intifada, followed in the wake of Israeli Prime Minister Ariel Sharon's controversial visit to the Al-Aqsa mosque on the site of the Dome of the Rock to assert Israeli control.

Group name	Total incidents	Total casualties	Suicide events	Suicide casualties
Fatah	180	1596	22	640
Popular Front for the Liberation of Palestine (PFLP)	63	505	7	161
Hamas	543	3474	50	2485
Palestinian Islamic Jihad (PIJ)	150	1165	29	787
Unknown/Other	1798	2754	38	485
Subtotal (5 groups)	2734	9494	146	4558
Percent of total (48 groups)	90.6%	81.9%	94.2%	94.3%

Table 1: A summary of the events and casualty statistics for each of the main actors on the Palestinian side of the Israel-Palestine conflict.

the source of the information. The MIPT database contains both transnational and purely domestic events, and has been used in several recent studies of terrorism (Bogen and Jones 2006; Clauset et al. 2007). In general, it can be considered independent and complementary to the more popular ITERATE data set (Mickolus et al. 2004), which is limited to transnational terrorist events.

The MIPT database contains information about terrorist events worldwide between 1968 and the present. Of these events, we select only those that occurred in the conflict region itself — i.e., Israel, and Gaza or the West Bank. We have a total of 3,017 events; 81.6% of which have occurred since the beginning of the Al-Aqsa Intifada in September 2000. When it becomes relevant which of the 48 groups is associated with a particular event, we restrict our analysis to Fatah, PFLP, Hamas, PIJ, and the catchall group “Unknown/Other”, as these account for over 90% of the Israel-Palestine events in the database; in terms of violent events, these five can thus be considered the primary actors in the conflict. Table 1 summarizes these events by group.

### 3 A conceptual model of the Israel-Palestine conflict

Before plunging into our empirical analysis of the conflict data, we will make a brief digression to describe a simple conceptual model of the complex dynamics of the Israel-Palestine conflict. First, the conventional theory of substitution suggests that the actions of Palestinian groups will be

determined, or primarily influenced, by counter-terrorism actions taken by Israel. However, as we have already suggested, this theory does not allow for strategic decisions based on other factors. In the complex ecology of Palestinian groups, these factors can, and do, play a significant role in determining the character of violence. In particular, we expect that the inter-group competition for the support of the Palestinian people is crucial. That is, a competitive environment between the different factions implies that one group's optimal response or action to increase its support among Palestinians is partially a function of other groups' actions and responses. Conceptually, we can represent the interplay of these factors as a "sandwich" (Fig. 1) in which the Palestinian political groups vie for, and depend upon, the support of the Palestinian people, subject to the constraints imposed on them by the actions Israel takes to protect itself.

There is, in fact, reasonable historic evidence for exactly this kind of interplay on the Palestinian side. Fatah, in part through its dominance of the PLO, has been the central organization on the Palestinian side. However, its involvement in negotiations with Israel and the Oslo accords in the early 1990s was quite unpopular among large segments of the Palestinian populace, which led to a hemorrhaging of public support for Fatah. Moreover, Fatah's perceived ineffectiveness in terms of providing basic security and social services to the Palestinian people and the perceived corruption among its leadership have further undermined its popularity. These shortcomings provided opportunities for other organizations to increase their support by opposing or filling-in for Fatah. Hamas, in particular, has successfully capitalized on Fatah's woes by providing social services in an efficient manner, and, through its suicide attacks, the perception of strong resistance to Israel's incursions into the Palestinian territories. Fatah, in turn, may have found it difficult to deal directly with the aforementioned sources of discontent. Its emulation of Hamas's suicide attacks in the Second Intifada, however, would theoretically mitigate some of Hamas's military advantage.

Thus, in general, we should expect the statistics of the Israel-Palestine conflict to be significantly more complicated than the conventional theory of substitution suggests. In particular, actions by Palestinian groups may be stimulated by actions from Israel, from other Palestinian groups,



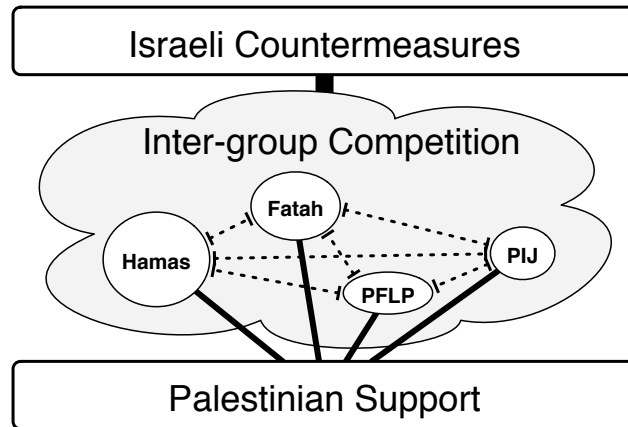


Figure 1: The “sandwich” conceptual model of the Israel-Palestine conflict, illustrating the three forces that constrain the strategic decisions made by Palestinian groups.

or from interactions with the Palestinian people. With this conceptual model, and its corresponding predictions, in hand, we now turn to the empirical analysis portion of our study.

## 4 Empirical analyses

### 4.1 Data

As mentioned above, we draw our terrorism event data from the MIPT (2006). We draw public opinion data from the Palestinian Center for Policy and Survey Research (2007), which routinely conducts polls on a variety of issues in different areas of the Palestinian territory.<sup>5</sup> Of the large amount of data in these polls, we focused specifically on the questions asked between 1994 and 2006 concerning how much support individuals give to Fatah, PFLP, Hamas, and PIJ respectively.

To get a sense of the political context in terms of other antagonistic and cooperative behavior between the groups, we also consider the Levant data developed by the Kansas Event Data System.<sup>6</sup>

<sup>5</sup>The Jerusalem Media and Communication Centre (2006) conducts similar polls. We find that an analysis of the JMCC data yields results consistent with that of the PSR data.

<sup>6</sup>See <http://web.ku.edu/keds/data.dir/archives.html>

These data are generated from automated coding of English-language news reports, and identify specific events where a particular actor—i.e., the source—carries out an identifiable action against another actor—i.e., the target—(see Schrodt and Gerner (1994) for further discussion on coding event data). The event codes in the Levant data are classified in terms of a set of categories (known as WEIS codes, developed in the earlier World Event Interaction Survey data project), which can then be mapped onto a numerical scale of conflict-cooperation created by Goldstein (1992). We aggregate all events between actors over weeks, and assign a score of zero to weeks with no recorded events.

Finally, we draw counter-terrorism data from the Israeli Ministry of Foreign Affairs (2006). The Ministry provides brief reports of Israeli anti-terror activity from 1995 onward.<sup>7</sup> Events are coded as counter-terrorism measures if they indicate Israeli actions against terrorist threats, such as the confiscation of funds, and the direct targeting or arrest of Palestinian terrorist operatives and/or their supporters. Other reports in the Ministry’s anti-terrorism data describe events not related specifically to counter-terrorism efforts, such as government statements on prisoner exchanges, announcements, or condemnations of violent activities; we exclude these from our analysis.

## 4.2 Attacks and counter attacks

We begin by considering the relationship between terrorist attacks and countermeasures.

During the Al-Aqsa Intifada (September 2000 to the present), Israel’s active counter-terrorism<sup>8</sup> efforts clearly fall into two qualitatively different strategies. First, prior to the end of 2003, we find that changes in Israel’s activity level are strongly *anti*-correlated with changes in the number of suicide incidents ( $r = -0.47, p < 0.01$ )<sup>9</sup>. That is, during this period, Israeli and Palestinian

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<sup>7</sup>For more information see the Ministry’s anti-terror activity reports, accessed October 31 2006, at [http://www.mfa.gov.il/mfa/terrorism-obstacle to peace/terrorism and islamic fundamentalism-/](http://www.mfa.gov.il/mfa/terrorism-obstacle%20to%20peace/terrorism%20and%20islamic%20fundamentalism/)

<sup>8</sup>We define *active* counter-terrorism efforts as those which require targeted decisions by Israeli officials, while *passive* efforts encompass environmental and physical barriers, such as the security fence project initiated in May 2002.

<sup>9</sup>Throughout this paper, we report  $r$  the Pearson correlation coefficient for some quantity, and its  $p$ -value, the result

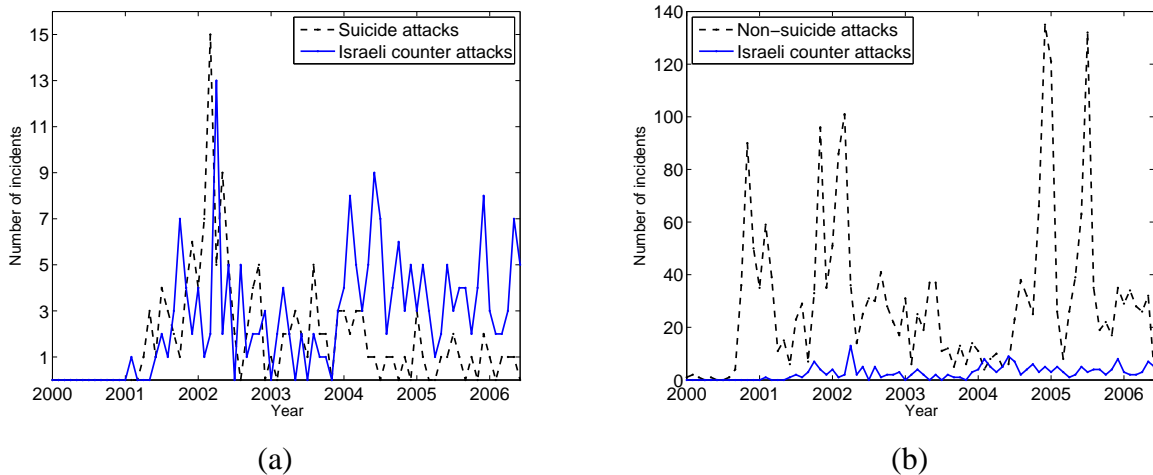


Figure 2: Incident counts for (a) suicide and (b) non-suicide attacks, and for Israeli counter-terrorism events. Between 2001 and the end of 2003, Israel pursues a clear tit-for-tat strategy with the Palestinian groups. Beginning in 2004, Israel clearly pursues markedly different strategy, with its counter-terrorism attacks being largely independent of the incidence of suicide attacks.

groups were effectively pursuing a tit-for-tat strategy,<sup>10</sup> in which each actor escalates their activity in response to the other’s recent activity<sup>11</sup> (Fig. 2a). This pattern of reprisals by both sides of the Israel-Palestine conflict runs counter to the conventional assumption that increased counter-terrorism activity can only suppress future terrorist activity (Rosendorff and Sandler 2004; Sandler et al. 1983). Further, we find that during this time, the Palestinian groups collectively pursued a single strategy – suicide attacks – as their response to Israeli counter attacks. In contrast to the temporal dynamics of suicide attacks, there is no significant correlation for non-suicide attacks (Fig. 2b) over the same period ( $r = -0.10, p > 0.5$ ).

Beginning in January 2004, however, changes in the frequency of suicide attacks and counter attacks become uncorrelated ( $r = -0.21, p > 0.25$ ), illustrating an end to the tit-for-tat dynamic. Further, the overall frequency of attacks shifted decisively between these two periods: the rate of suicide attacks dropped from 3.0 per month to only 1.1 per month, while the rate of counter attacks

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of a standard  $t$ -test for its significance.

<sup>10</sup>For a more detailed explanation see [http://news.bbc.co.uk/2/hi/middle\\_east/3556809.stm](http://news.bbc.co.uk/2/hi/middle_east/3556809.stm).

<sup>11</sup>For more on this process, see Jaeger and Paserman (2005).

increased from 2.2 per month to 4.2 per month.

Supplementary, we also consider what relationship the *severity* of Palestinian attacks, i.e., the number of casualties, have with the Israeli counter attacks (data not shown). During the tit-for-tat period, we find a slightly weaker anti-correlation between changes in the severity of suicide attacks and the frequency of Israeli countermeasures ( $r = -0.31$ ,  $p < 0.1$ ), and that this relationship seems to disappear in the second period, ( $r = -0.23$ ,  $p > 0.2$ ). Overall, this dynamic behavior suggests that the Palestinian groups considered the severity of their response to Israeli counter attacks as being somewhat less important than responding proportionally in frequency. It could, however, also be the case that Palestinian groups simply have less control over the resulting severity of their attacks.

Initially, these results are completely consistent with our expectations given the theory of substitution, i.e., the Palestinian groups shifted to non-suicide attacks because Israel's new strategy (beginning in 2004) made it more difficult for them to execute suicide attacks. Indeed, the official explanation given by official Israeli sources matches this story quite closely, and there is some causal empirical evidence to support these claims. In particular, during the second time period, Israel made significant progress in building the security fence while also relying on the targeted assassinations of bomb makers, attack coordinators, and suicide bombers themselves in an effort to undermine the Palestinian groups' ability to conduct suicide attacks (IMFA 2006).

However, substitution following countermeasures alone cannot explain the other details of these statistics. For instance, it cannot explain the large number of suicide attacks that occurred in the first period (2001 through 2003), and it cannot explain the appearance of the two dramatic spikes in non-suicide attack incidents in late 2004 and mid-2005. One weakness of an analysis that relies only on the conventional theory of substitution is that it assumes that changes in strategies by the non-state actors are driven, in a causal manner, by the actions of the state. However, as suggested by the data shown in Figure 2, other factors must also drive the behavior of the Palestinian groups.

In the next two sections, we give some empirical evidence for several such factors. In general, we find that the Palestinian groups are highly strategic in their use of violence, and that their choices of when and how to attack are driven at least as much by internal, i.e., inter-group, considerations, as by actions by Israel.

### 4.3 Competition, imitation, and the role of public opinion

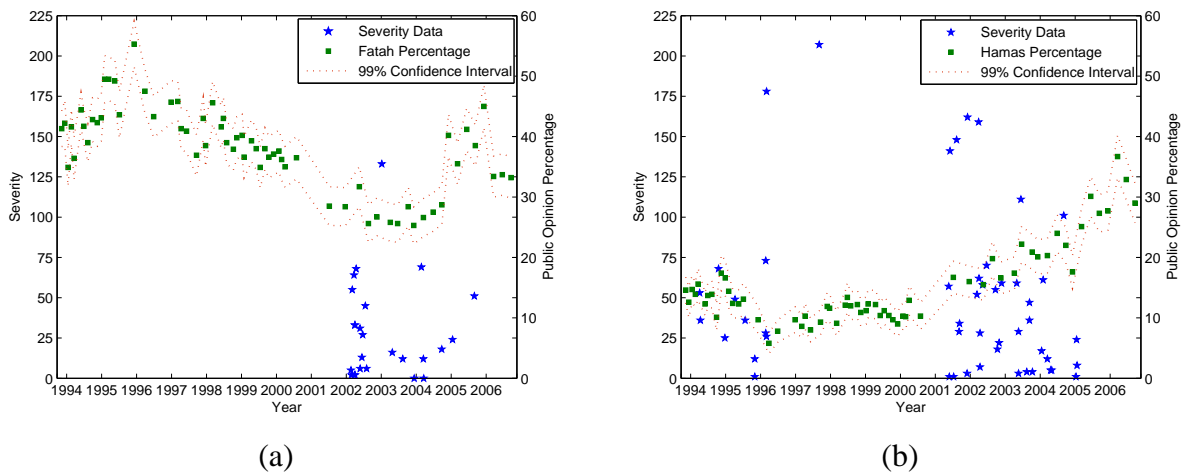


Figure 3: Suicide attack severity (shown as blue stars with severity given by the left axis) over time for (a) Fatah and (b) Hamas, overlaid on the public approval ratings for each of the groups (shown on the right axis).

In the previous section, we suggested that the conventional theory of substitution cannot explain many of the statistical features of violence that we observe in the Israel-Palestine conflict. In particular, this theory suggests that the many groups on the Palestinian side should behave similarly, and primarily in response to Israel’s counter-terrorism efforts. In this section, we consider this question in the context of the strategic use of suicide attacks, and show that inter-group competition can be as significant a driving force in shifts in strategic behavior as Israeli actions.

Bloom’s (2004) analysis of the relationship between shifts in Palestinian public opinion and the incidence of violence in the Israel-Palestine conflict suggests that suicide attacks tend to serve

a dual purpose: they attack Israel by punishing and terrorizing Israeli citizens who, on account of Israel's policy of universal conscription, many Palestinians see as being complicit in the military engagement against Palestinians, and they raise the profile of the group responsible for the attack.

Figure 3 shows the public opinion poll data for the Palestinian approval of Fatah and Hamas between 1994 and 2006. Overlaid on these trends are the severities of the suicide attacks claimed by these two groups over the same period (Fig. 3a and b, respectively). Notably, we see that both groups carried out a large number of attacks from 2001 to 2002 – as part of the more general tit-for-tat behavior during the beginning of the Second Intifada, described in Section 4.2. However, Hamas initiated its suicide campaign several months prior to Fatah. Further, Fatah's first suicide attack ever was in February 2002, yet suicide attacks had been used by other groups on the Palestinian side since Hamas pioneered the tactic in April 1994. Why then, did Fatah suddenly adopt Hamas's strategy? We argue that Fatah increasingly viewed Hamas as a plausible competitor for the public's support, and imitated Hamas's strategy of suicide bombing in an effort to mitigate its loss of standing.

In the period following the signing of Oslo II and the beginning of the Al-Aqsa Intifada – the period of roughly 1996 to 2000 – Fatah's public support consistently decreased, at a rate of about 2.5% per year, from 48% in 1996 to about 38% in 2000. Over the same period, support for Hamas among the Palestinians increases only marginally, by about 1% per year, and never exceeds its 15% approval rating in 1994. Over this period, Fatah claimed no violent attacks, while Hamas claimed several extreme suicide attacks, such as the 4 March 1996 suicide bombing in Tel Aviv, and the 4 September 1997 suicide bombings in Jerusalem, both with roughly 200 casualties (Fig. 3d). Perhaps because public support for such attacks was not high (roughly 30% between 1994 and 2000 (Jerusalem Media and Communication Centre 2006)), approval for Hamas did not change significantly in response to these events.

With the beginning of the Al-Aqsa Intifada, however, the situation has changed. Fatah's popularity continued to erode, falling below 30%, while Hamas's popularity rose to almost 20%, in

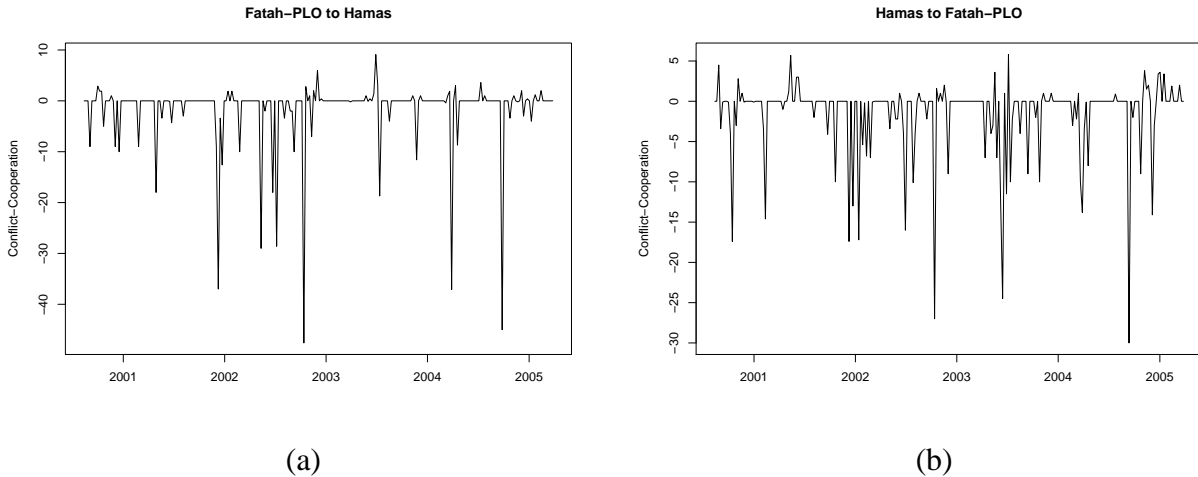


Figure 4: Conflict cooperation scores for directed behavior of (a) Fatah to Hamas (b) Hamas to Fatah, with events aggregated over weeks.

2001. Although both conducted low-severity campaigns of non-suicide attacks beginning in the second half of 2000, Hamas distinguished itself from Fatah early on by conducting seven suicide bombings in 2001. However, nine months after Hamas's first suicide attack in this period, Fatah carried out its first suicide attack. The coincidence of Hamas's approval rating being relatively close to Fatah's surely produced concern among Fatah's leadership. Further, given that in this period, Palestinian approval of suicide attacks has risen to more than 60% (Jerusalem Media and Communication Centre 2006), Fatah may have judged that imitating Hamas's successful suicide bombing campaign would moderate its loss in public standing. Indeed, subsequent to their spate of suicide attacks in 2002, Fatah's approval rating stabilized, although Hamas's continued to grow.

A troubling alternative to this interpretation is that the use of suicide attacks in 2002 by Hamas and Fatah was a coordinated, rather than competitive, effort. However, the conflict-cooperation scores generated from events in the Levant data (Fig. 4) do not suggest that relations between Fatah and Hamas became generally more cooperative after the First Intifada. Indeed, the average conflict-cooperation scores are higher in the period prior to the first recorded suicide attack by the al-Aqsa Martyrs' Brigade on 29 November 2001 ( $-0.928$  in the case of Fatah-to-Hamas events,

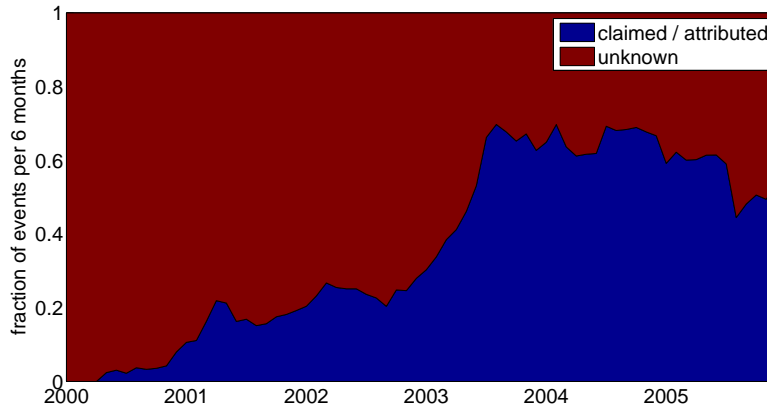


Figure 5: Proportion of events that were claimed or attributed to Fatah, PFLP, Hamas or PIJ versus those unclaimed (i.e., attributed to an Unknown or Other group), with events aggregated over a six-month sliding window.

and  $-0.619$  for events from Hamas-to-Fatah) than in the following period ( $-1.728$  and  $-1.794$ , respectively). Thus, these scores provide little support for the idea that the spate of suicide attacks was the result of a coordinated effort between the two groups, but are consistent with our conjecture of a competitive relationship.

In further support of the competitive relationship between Hamas and Fatah, we see that the fraction of attacks claimed, or attributed, by some group increases significantly over this timeframe. Figure 5 shows this proportion for a sliding window of six months, which increases from virtually zero to almost 70% by the middle of 2003, suggesting that Palestinian groups pursued strategies in which it was important for their name to be associated with attacks. Were Fatah and Hamas (and other groups) cooperating, such distinctions would not seem necessary, while such distinctions would be crucial in a competitive environment.

Finally, we note that the use of suicide attacks, even during the Second Intifada, when popular support for them was relatively high, does not necessarily yield greater support among the Palestinian people. Although the behavior of the opinion polls for Fatah and Hamas suggest that suicide attacks did have an impact on their standing with the public, the PFLP and PIJ also conducted



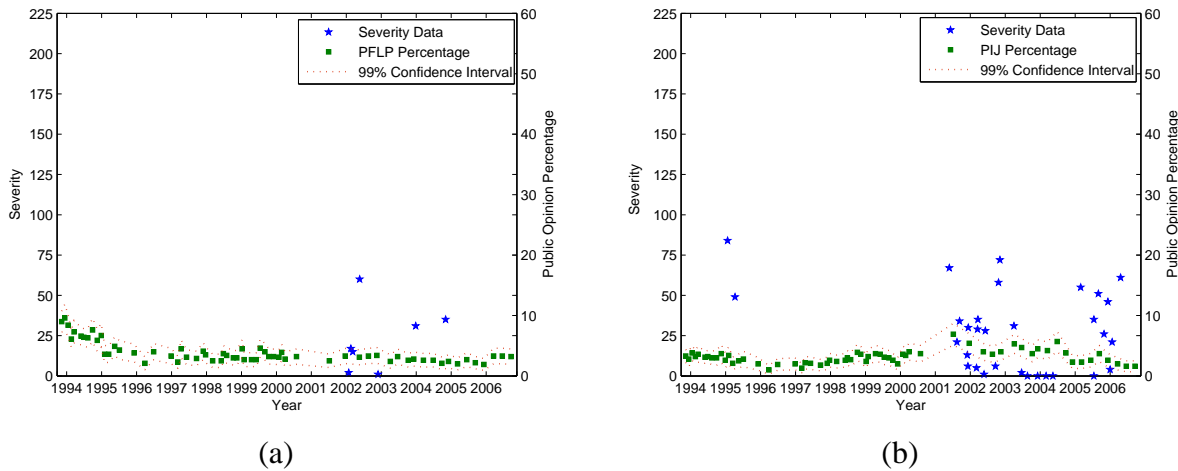


Figure 6: Suicide attack severity (left axis; blue stars) over time for (a) PFLP and (b) PIJ, overlaid on the public approval ratings for each groups along with those for Hamas and Fatah (right axis).

suicide attacks over the same period, but saw no comparable increase in their public approval. (Fig. 6). This asymmetric payoff for some groups conducting suicide campaigns, but not to others, suggests that even when the public supports such attacks in general, they are not a sure method for raising the standing of a group, in contrast to Bloom’s (2004) thesis. One interpretation of this effect is that a plausible challenger to a dominant organization, such as Hamas challenging Fatah, can enhance its public standing by engaging in particular forms of dramatic and high impact form of terrorism. Furthermore, the dominant organization can partially contain the growing popularity of the challenger by emulating the latter’s methods, thereby removing the apparent novelty or distinctiveness of the challengers’ strategy that resonated with the public. Less established and more obscure groups, however, do not necessarily see similar benefits from resorting to particular tactics in and of itself. More generally, the incentives for resorting to terrorism may be very different for “large” groups that are generally known and “small” groups that the public is less familiar with, unless such small groups first manage to establish themselves in a position as a plausible challenger or central player. In the case of Hamas, its growth into a large organization able to capture significant Palestinian support seems due at least in part to its capacity as a public good provider,

something that the PIJ does not do. The PIJ also suffered a blow in 1995 when its leader Fathi Shaqaqi was killed. Hamas' rise to power in Palestine may not have been borne out of the use of suicide bombings, but its success as a large organization using such a tactic does appear to have caused others to emulate its approach.

#### **4.4 Election-driven behavior**

Another statistical feature that the conventional theory of substitution fails to explain is the intermittent spikes in the frequency of non-suicide attacks (Fig. 2b), and, in particular, the dramatic spikes in late-2004 and mid-2005, with more than 100 events each. In this section, we again suggest that internal politics on the Palestinian side – in particular, the first municipal and Presidential elections since 1996 – can explain the first of these features, while the second can be understood as a symbolic response by Hamas in the run-up to the Israeli evacuation of 25 Jewish settlements in Gaza and the West Bank.

During this period, Hamas was, by far, the most active of the major actors on the Palestinian side, and the statistics of the conflict are dominated by its attacks. Figure 7 shows the frequency of incidents (suicide and non-suicide; upper pane) and the average number of casualties per attack (lower) for Hamas from 2000 onward. To illustrate the relationship between these statistics and the Palestinian's internal politics, we overlay these series with the dates of Palestinian elections (municipal, legislative and Presidential; the first since 1996).

From this combination, several patterns are clear.<sup>12</sup> Most notably, Hamas abandons its use of suicide bombing campaign shortly after the January 2005 Presidential election.<sup>13</sup> Further, between 2001 and 2005, the average severity of these suicide attacks consistently decreases – suggesting that either Israel's countermeasures (see Section 4.2) were increasingly effective at curtailing the

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<sup>12</sup>A similar analysis using Israeli election dates suggests that Palestinian violence is not significantly driven by external politics, at least in this period.

<sup>13</sup>At the time of writing, the last documented suicide attack by Hamas was on 18 January 2005, near the Gush Katif settlement in the Gaza Strip (National Memorial Institute for the Prevention of Terrorism 2006).

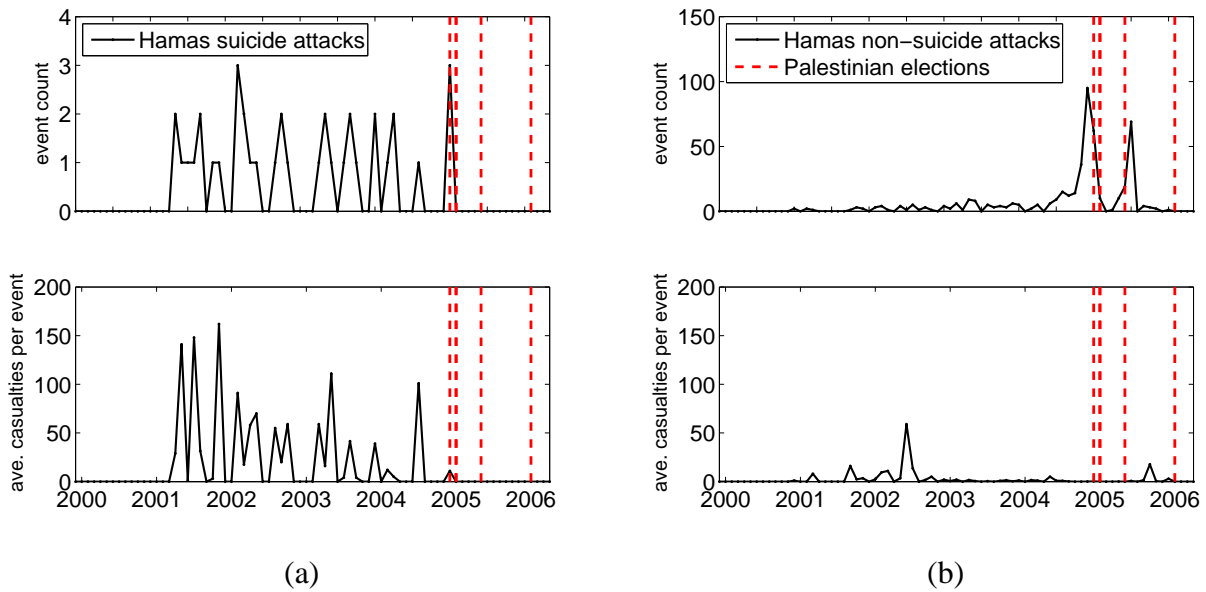


Figure 7: Incident frequency (upper pane) and average casualties per attack (lower) for (a) suicide and (b) non-suicide attacks by Hamas, from January 2000 to June 2006. The right-most election line corresponds to the 2006 legislative elections.

severity of these attacks, or Hamas deliberately attenuated its bombing campaign for internal reasons.

The conventional theory of substitution would lead us to conclude that the large spike in non-suicide attacks from October through December 2004 is a direct consequence of Israel's countermeasures making the cost versus benefit of suicide attacks relatively unfavorable compared to non-suicide attacks. But this interpretation does not explain the timing of these events, which occurred precisely before the Palestinian Presidential election in January 2005, the first in almost 10 years. Given this coincidence, a plausible alternative explanation for Hamas's shift away from severe suicide attacks toward non-severe non-suicide attacks is internal Palestinian politics rather than external countermeasures.

In addition to the Presidential election, three rounds of municipal elections (December 2004, January 2005 and May 2005) were also held in this timeframe. It is possible that Hamas's activities were driven by these smaller elections, as the dramatic activity around the New Year in 2005 also

preceded two of the three. However, the lack of any activity preceding the last of the three supports our conclusion that the 2004 spike may have been driven by the upcoming Presidential election alone.

Politically, Hamas boycotted all four of these elections, and chose instead to use violence in a highly strategic way to independently demonstrate its political and military strength. Indeed, these actions may now be seen as part of a larger strategy in preparation for the 2006 legislative elections, which Hamas did not boycott. That is, finally achieving a competitive status with Fatah in late 2003, with respect to support from the Palestinian people (Fig. 3), Hamas may have believed itself to now be a viable electoral challenger to Fatah's dominance in the Palestinian Authority. From this point onward, Hamas seems to have shifted its strategic use of violence to prepare for precisely such a challenge at the legislative level, phasing out its use of suicide attacks – perhaps partially encouraged by effective Israeli countermeasures – and increasingly using non-lethal, non-severe attacks to demonstrate its military strength. Another consideration may have been Hamas's desire to continue to attack Israel, but without directly stimulating an Israeli retaliation that might undermine Palestinian support for Hamas in future elections.

In agreement with this theory, we note that in the vicinity of the legislative election in 2006 – the first that Hamas did not boycott – we see virtually no attacks by Hamas, either suicide or non-suicide.<sup>14</sup> Another plausible factor influencing Hamas's behavior in this timeframe is its incentive to signal its ability to control the use of violence to both the Palestinian and Israeli audiences. In prior time periods, the Palestinian Authority's peace negotiations with Israel were disrupted by suicide attacks. Kydd and Walter (2002) suggest that this behavior implies that terrorism is used as a strategic “spoiler,” whereby attacks are used to violate Israel's trust in the Palestinian side to control its extremist factions. Hamas's abandonment of suicide attack thus may signal authority over its extremist factions and, more generally, its ability to control violence and engage

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<sup>14</sup>In fact, since the mid-2005 spate of attacks, Hamas has not resorted to concentrated non-suicide attacks at any comparable level.

in effective internal policing. This control might then increase Hamas's appeal as an effective political organization to both Palestinians and Israelis, demonstrating to Palestinians that it can guarantee security, while signaling to Israel that it will be negotiating with a party able to control the violence. Certainly in a political environment where multiple groups compete to coerce Israeli policies, demonstrating organizational control by freezing the use of a tactic that may be the most effective (and, by extension, the most detrimental to Israeli interests) seems to be a reasonably attractive strategy.

Finally, we observe that the second spike of non-lethal, non-suicide attacks, in mid-2005 was largely in response to Israel's planned evacuation of 25 settlements in the West Bank and Gaza. Hamas launched a large number of mortar and Qassam rocket attacks at about half of these settlements, and a few that were not being evacuated, but largely inaccurately. In light of our previous discussion, this behavior appears to be largely symbolic – again demonstrating Hamas's military strength, but not in a way that would stimulate a vigorous response from Israel, or halt the pull out.

## **5 Substitution and complementarity in terrorism**

In the previous section, we argued via several examples within the Israel-Palestine conflict that a conventional treatment of strategic substitution in terrorism (Enders and Sandler 2004), which locates actions by the state as the central driving force, leaves out several important influences on terrorism, and in particular, it ignores the internal dynamics of the Palestinian side. If these findings can be generalized, then we expect to observe qualitatively similar behavior in other regional conflicts with a complex mix of actors, to the extent that the specific political context and phase of the conflict allows. In this section, we extrapolate our analysis of the Israel-Palestine conflict into a set of stylized conjectures about the features we expect will be influential in the resort to terrorism, and the character of violence, for conflicts with multiple non-state actors. Here, we provide brief qualitative evaluation of these general principles, and leave their more systematic or quantitative

evaluation for the future.

First, we should consider whether relations between actors with each side of the conflict are primarily competitive, or cooperative. In the former case, a resort to terrorism may be more likely as less extreme groups face competition from more extreme factions over scarce resources such as public support, recruits, financing, media attention, etc. Likewise, a competitive atmosphere can make negotiations between key antagonists difficult if any agreements can be undermined by other groups on one of the side (a la the “spoiler” effect of Kydd and Walter).

An important extension of this observation is that the cohesion within groups may also be vitally important. If, internally, groups are cooperative and/or nonconformists are contained, political negotiations will likely be more successful. When internal dissent splits groups, political negotiations may be spoiled by members of the very parties that are participating in talks. For instance, in Northern Ireland, talks between British authorities, Unionists, and Sinn Fein may have been undermined on numerous occasions because of the actions of IRA members who saw Sinn Fein’s participation in politics as an illegitimate extension of the Republican cause. In the Israel-Palestine conflict, as we suggested above, Hamas’ ability to control its internal factions may very well have contributed to its electoral success.

Second, we should consider whether the political process engages or marginalizes the interests of the extremists. We suggest that marginalizing non-trivial extremist groups may, in fact, encourage said groups to resort to violence by providing them an incentive to demonstrate their military importance. By contrast, cases where extremists are engaged in conventional and non-violent political processes – e.g., perhaps through elections – may reduce violence by providing groups with an incentive to demonstrate their ability to control violence.

For some groups, engagement in politics indicates a level of unacceptable acquiescence, or assent to the very system they currently oppose. These groups remain outside of the main political arena, and may see violence as their only tactical option to exert the degree of influence they desire. Although our study focuses on politically engaged violent groups, the significance of political

involvement should not be overlooked. Groups that are engaged in the political process during a conflict may demonstrate very different characteristics than those that choose to remain outside the political arena. Indeed, Hamas' behavior prior to 2005 is similar to one of these violent but marginalized political groups, while its behavior since has been considerably moderated. Further, we note that attacks carried out after the IRA began pursuing its "ballot paper in one hand and the armalite in the other" strategy—i.e., began supporting Sinn Fein's political role and a pan-nationalist alliance—have been described as more specific and less destructive. Moloney (2002), for example, notes that

The IRA's military strategy had to be tailored so that it would not offend the rest of nationalist Ireland. That meant the IRA had to concentrate on hitting targets in England and military targets in the North while avoiding civilian casualties of any sort in Ireland.

Third, we conjecture that the degree of alignment between public opinion and the ideology of group(s) is inversely related to the frequency and severity of attacks. That is, when a group becomes accepted as representatives for a large number of constituents, it also has a greater incentive to engage in policing activity to prevent violent attacks that may stimulate counterproductive or overly harsh responses from the other side. Furthermore, because such groups are sensitive to public opinion, they will likely be more cautious in attacking targets that are considered illegitimate among potential or existing supporters.

Fourth, important forms of strategic innovation in terrorism may come from competition with or imitation of other groups. We have pointed to how Fatah appears to have adopted the signature strategy of Hamas in the wake of their declining public standing. Imitation can apply even in conflicts limited to a single or a few groups, as countries may look to actors in other conflicts, e.g., the IRA campaign against the British inspired Jewish settlers in Palestine to adopt similar tactics. And, similarly, Irish Republican prisoners in the Long Kesh prison during the early 1980s spent at great deal of time learning and discussing the characteristics of other revolutionary struggles (McKeown

2001). Similarly, the PFLP was initially inspired by the ideas of guerrilla warfare popularized by Che Guevara, and, in turn, their innovative use of aircraft hijacking in 1968 led to a surge of subsequent hijackings, including many by groups not connected to the Israel-Palestine conflict, such as Sikh separatists.

Finally, although we have not thoroughly explored this issue here, we have characterized attacks by both their lethality and tactical approach to demonstrate our arguments. However, most of our discussion is contained to tactical substitution patterns, such as the shift from or toward suicide attacks. In this regard our discussion mirrors the literature on substitution that focuses mainly on tactical considerations. Hamas' substitution to non-severe non-suicide attacks prior to the 2006 elections is curious because it represents both a tactical shift in the type of violence and a change in the deadliness of the attacks. It is difficult to discern whether the change in severity and approach, or the combination of both, has led to the effect that Hamas desired. However, we do believe that the severity of attacks is a characteristic of violence that demands scrutiny, particularly because many groups such as ETA and the IRA have gone to lengths to reduce the number of casualties caused by their attacks. For instance, on July 27th 2001, ETA called to warn Spanish authorities about a bomb in the Malaga airport which certainly would have killed or injured many. The attention that groups pay to this aspect of their attacks indicates that the severity of attacks is a strategic consideration independent of their incidence, and we would suggest that it is likely to be subject to many of the factors we have introduced here.

## **6 Conclusions**

Although the conventional treatment of terrorism in terms of strategic substitution is, on its face, an exceedingly reasonable way to explain the strategic choices of terrorist groups, it fails to account for the complexity of their actual behaviors, such as their timing and severity. We claim that this situation is, in part, because terrorist organizations are driven at least as much by their own internal



conflicts and by their incentives to engage in non-violent means for achieving their political goals, as they are by the state's actions to curtail their actions.

By using a quantitative, data-centric approach, we characterize several of these unaccounted-for factors as they relate to the strategic dynamics of the Israel-Palestine conflict since 1994. Most notably, we find that the competitive nature of the complex ecology of Palestinian factions seems to explain much of the apparently idiosyncratic violence in the conflict. Indeed, through this lens, we find that Palestinian groups are highly strategic in their use of violence, and that the behavior of a single group is difficult to understand in isolation from the other groups that they coexist and compete with.

In some cases, we find behavior exhibiting the “spoiler” logic of Kydd and Walter (2002) and the attack-and-publicity logic of Bloom (2004) for the use of suicide attacks. However, we also find that suicide attacks *per se* are rarely associated with measurable improvements to a group's public standing, in contrast to Bloom's conclusions (2004). This fact suggests that marginal groups such as PIJ and the PFLP may employ suicide attacks for different reasons than larger and more established groups like Fatah and Hamas. From a policy perspective, this difference suggests that providing the marginalized extremist factions with a viable, non-violent alternative for achieving their strategic goals may be a way to reduce the frequency of suicide, or non-suicide, attacks. Hamas's behavior after the decision to hold legislative elections in 2006, for instance, demonstrates that such non-violent paths may be an effective means of tempering the character of violence in a conflict. When groups remain outside of the political arena altogether, counter measures may encourage cooperation between political and non-political actors to ensure some degree of internal policing and lessen the threat from marginalized organizations.

However, the competitive environment itself must also be considered, as a weakened main-stream group may adopt the tendencies of more extremist but marginal groups, if they feel the public will support them for it, as seems to have been the case for Fatah's response to Hamas's growing popularity. Finally, we note that because counter-terrorism activities can, in some cases,

actually *increase* the future incidence of terrorist attacks, as we saw in Section 4.2, we suggest that such measures should be used only in conjunction with other, non-violent efforts to disincentivize violence altogether.

In general, our findings point out how important the internal-dynamics of resistance movements are in deterring or encouraging terrorist activity. For policy makers, this point should not be lost as devising strategies to deal with one type of attack may prove fruitless when pressures within the resistance community change altogether. Without public support, groups often cease to exist. Therefore, protective measures should consider that attacks will likely be tailored towards both gaining a domestic support base and coercing an enemy government.

In closing, our study shows the utility in stepping away from the model-centric perspective on terrorism to use a more data-centric approach to learn about complex conflicts with multiple actors. Although the specific political context and actors will undoubtedly vary across conflicts, we believe it is possible to formulate organizing principles about the dynamics of strategic substitution and complementarity in terrorism that can be applied to other conflicts.

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