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Introduction

Early in its campaign in Northern Ireland, the Provisional Irish Republican Army (PIRA) faced a problem. Improving security forces' activities and the strengthening of military bases and police stations made it increasingly difficult for the Provisionals to stage attacks on these targets with their preferred weapons. To solve this problem, PIRA made the decision to pursue a new weapon—the mortar.

Although PIRA could have sought out mortars from the international arms market, the group chose to build its own. Reportedly drawing on knowledge from military reference books, the Provisionals began to manufacture mortar units in local machine shops and safe houses. PIRA's path to developing mortar technology was not a smooth one. Early versions of the weapons threw their shells far off course, sometimes exploding in residential areas and schools, killing and maiming civilians. Shells that reached their targets often didn't explode or exploded ineffectively. Units with design defects exploded in the mortar tube, killing the PIRA members attempting to use them.

PIRA made many modifications to their mortars' designs to correct their flaws and better adapt them to the group's operational needs. The Provisionals' engineers observed the performance of their creations, identified their shortcomings, experimented with alternative designs, and introduced the new models into the group's arsenal. Cells within PIRA became expert in the use of the weapon and applied their expertise both to constructing new mortar designs and to applying the weapons in high-profile attack operations. The group was innovative in its tactics. It built mortars into vehicles for greater mobility and fitted them with timers so individual Provisionals could place the weapons and disappear long before an attack took place.

Over time, the group's learning and engineering efforts paid off, and knowledge of how to make and use mortars effectively was distributed among its members, becoming a core part of the organization's capabilities. The group's perseverance reaped terrible dividends late in its operational career, as mortars made it possible to stage some of PIRA's highest-profile operations: a direct attack on the British Prime Minister's residence at 10 Downing Street, multiple mortar attacks on

*Heathrow Airport, and an attack on the police station at Newry which claimed the lives of nine members of the Royal Ulster Constabulary.*¹

Terrorism² and insurgent violence have become constant threats in today's world. Nearly every day, nonstate groups in different countries carry out violent actions, many of which can be characterized as terrorism. The threat of such violence drives ongoing global military action, and the need to protect the U.S. homeland against terrorist attack is a primary shaper of the country's domestic political agenda.³

The experience of PIRA described above illustrates the importance of terrorist groups' ability to change and adapt. Faced with a challenge to their operational capability, PIRA shifted, adopting a new attack form that reconstituted the threat they could pose. The ability to modify tactics and behaviors is critical across all areas of terrorist group operations.⁴ Such adaptive behaviors can enable terrorist groups to

- Become more effective at applying their chosen tactics and weapons⁵
- Adopt new, often increasingly damaging tactics and weapons
- Alter their behavior in an effort to fend off attempts to infiltrate, undermine, and destroy them⁶

The ability of terrorist organizations to change their operations effectively over time is inherently linked to their ability to learn.⁷ While changes in society, coun-

¹ Narrative adapted from Bell, 1998b; Geraghty, 2000; Glover, 1978; Harnden, 2000; O'Callaghan, 1999; Urban, 1992.

² In this report, we adopt the convention that *terrorism* is a tactic—the systematic and premeditated use, or threatened use, of violence by nonstate groups to further political or social objectives to coerce an audience larger than those directly affected. With terrorism defined as a tactic, it follows that individual organizations are not inherently “terrorist.” We use the terms “terrorist group” and “terrorist organization” as shorthand for “group that has chosen to utilize terrorism.”

³ Though many of the violent substate groups discussed in this study use tactics that are not purely terroristic in nature—for example, mixing traditional military operations against opposing security forces with terrorist bombings or assassinations—we use “terrorism,” “terrorist violence,” and “counterterrorism” as generic descriptors of groups' violent activities and government efforts to counter them.

⁴ For a variety of discussions of change and adaptation in terrorism and terrorist group activities, see Cragin and Daly, 2004; Crenshaw, 2001; Gerwehr and Glenn, 2003, pp. 49–53; Hoffman, 2001; Jackson, 2001; Kitfield, 2001; Stern, 2003; Thomas and Casebeer, 2004, pp. 35–38. We particularly acknowledge Lutes (2001), an unpublished paper that did not come to our attention until late in the study. Lutes brings the literature on organizational learning to bear on terrorism, specifically on al Qaeda.

⁵ Training of group members is a primary route through which organizations carry out this organizational learning function.

⁶ This adaptation can include the adoption of new learning behaviors.

⁷ While change in the way a group carries out its activities is frequently indicative of learning, the occurrence of change is not sufficient to indicate that organizational learning has occurred. Changes are not necessarily intentional; they can be made unintentionally or for exogenous reasons incidental to the behavior that is changed (e.g., a change may occur in one area simply as a result of a change made in another). In this study, we define learning

termeasures, or shifts in the public's reactions to types of attacks might provide the *motivation* for change, a terrorist group cannot adapt automatically. New tactics and novel capabilities do not become available without effort. Terrorist groups do not improve their ability to execute operations or increase their level of expertise with weapons simply because they want to do so. Organizations must be able to learn in order to identify opportunities and to have the wherewithal to take advantage of them with significant chances of success. The ability to learn marks the difference between a lucky organization that may fortuitously discover the solutions to its problems and a consistently effective one that can systematically act to fulfill its needs and advance its goals in a dynamic environment.

Terrorist groups' learning capabilities pose a significant challenge to the ability of law enforcement and intelligence organizations to protect the public. In addressing the threat posed by terrorism, such organizations face three central challenges:

- **Assessing threats and understanding terrorist group behavior.** Understanding a terrorist group's intentions and capabilities, the types of operations it may attempt, and its chances of being successful when it stages an operation is critical for effective efforts to combat terrorism. Because terrorist organizations are moving targets, the analyst must understand them in a dynamic context—not just what the organization is today, but what it might be tomorrow. Law enforcement and intelligence organizations must also rapidly identify the groups or individuals responsible for terrorist incidents so that action can be taken in response.
- **Developing and implementing counterstrategies.** Proactively defeating terrorism requires the ability to discover terrorist group activities, gather needed evidence and intelligence information, and disrupt operations and destroy group infrastructures and capabilities. To develop effective strategies for combating terrorism, law enforcement and intelligence action must be shaped so that it is appropriate for the specific situations of particular groups and the environments in which they operate.
- **Allocating resources and developing metrics to assess success in combating terrorism.** Because the resources that can be devoted to combating terrorism are finite, decisions must be made about how and where those resources should be allocated. Knowledge of terrorist groups' intent helps to make those decisions. There is less pressure to devote resources to thwarting the efforts of groups that are not interested in attacking a nation or its interests. However, the remaining

as sustained changes that involve intentional action by or within a group at some point—such as one or more of the following: intentional seeking of new knowledge or new ways of doing things; intentional evaluation of behaviors, new or old, that leads to efforts to retain valuable behaviors and discard others; and/or intentional dissemination of knowledge within a group or among groups when such knowledge is deemed useful or beneficial. Furthermore, we categorize as learning only changes that are beneficial to the terrorist group.

groups frequently pose more potential threats than it is possible to target with the resources available. Decisions must be made about deploying resources, and metrics must be developed to measure the results of those decisions to ensure that the most serious threats to national security and human life are being addressed.⁸

An understanding of how terrorist organizations learn may allow analysts to get inside a group's efforts to change and adapt and could thereby help the law enforcement and intelligence communities address all three challenges. Insights about terrorist group learning processes provide an approach to building an understanding of the dynamics of terrorist organizations, not just by tracking data on how they change but by exploring the ways those changes are realized. Such an understanding could facilitate better threat assessment and could also play a part in assigning responsibility for past terrorist incidents. Organizations' "learning histories" can help identify what group or groups could plausibly have carried out specific attacks.

In addition, an understanding of group learning processes might also help analysts identify and exploit key weaknesses in a group's organizational and operational makeup. Measures of terrorist group learning can help to separate groups whose capabilities may be bounded by an inability to adapt from those that can more readily shift to pose greater levels of threat, providing a key input to threat assessment and resource allocation.

About This Study

This research effort addresses two basic questions:

- What is known about how terrorist groups learn?
- Can that knowledge be used by law enforcement and intelligence personnel in their efforts to combat terrorism?

To answer these questions, we designed a methodology to explore why and what terrorist groups learn, to gain insights into their learning processes, and to identify ways in which the law enforcement and intelligence communities might apply those insights. The research process comprised four main tasks:

1. Review of the literature on organizational learning. The rich literature on learning in organizations is focused predominantly on learning in legitimate

⁸ See Cragin and Daly, 2004, for a discussion of the relative threat posed by terrorist organizations as a function of their differing capabilities and intentions.

groups, particularly commercial organizations, but it provides a wealth of models and hypotheses on group learning practices that can be applied to terrorist groups. Later phases of our study were informed by ideas and concepts drawn from this literature.

2. **Review of available literature on terrorism and insurgent violence.** We reviewed the published literature and other data sources on groups that have used terrorism to assess what was already known about organizational learning activities in such groups and to assist in selecting individual groups for detailed study.
3. **Terrorist group case studies.** The research process consisted primarily of preparing and reviewing a set of case studies of organizations that have used terrorism as a component of their violent activities. We selected five organizations for these case studies:⁹
 - Aum Shinrikyo
 - Hizballah
 - Jemaah Islamiyah (JI)
 - Provisional Irish Republican Army (PIRA)
 - The Radical Environmentalist Movement

These groups, having a variety of characteristics, were selected to cover the full spectrum of organizations that have used terrorism: Aum Shinrikyo is a religious cult that pursued chemical and biological weapons; Hizballah is a social and political movement with insurgent and terrorist aims and activities; JI is a smaller, better defined terrorist group linked to and influenced by the global *jihadist* movement; PIRA is a traditional ethnic terrorist group with a long operational history; and the radical environmentalist movement (focusing on terrorist activities claimed by organizations identified as the Earth Liberation Front and the Animal Liberation Front, among others)¹⁰ is an example of a much less-defined

⁹ Al Qaeda was deliberately *not* selected to be a case study group. The goal of the study was to examine organizational learning across different types of terrorist organizations to find commonalities and differences among their experiences. The rapid change occurring in al Qaeda during the study period and the volume of information available made it such a complex subject that we would not have been able to satisfactorily examine a sufficient number of other terrorist groups.

¹⁰ It should be noted that the radical environmental movement is significantly different from the other groups examined in this study. Examining the actions claimed by organizations identifying themselves as the Earth Liberation Front (ELF), the Animal Liberation Front (ALF), and others from the perspective that they are carried out by a defined “group” is problematic as these organizations function as pieces within a broader ideological movement, rather than defined and bounded groups in a traditional sense. However, because of assumed cross-membership of individuals and cross-fertilization among many groups within the radical environmentalist movement, law enforcement and counterterrorism efforts frequently treat ELF, ALF, and affiliated groups as a single organization for analytical purposes, while recognizing that the organization’s diversity adds a unique dynamic to such analyses. In this study we will refer to these groups as either radical environmentalists or, for shorthand purposes, ELF/ALF. Given the relevance of similar movements in modern terrorism—e.g., extremist right-wing, anti-globalization, violent anti-abortion, and global *jihad* movements—the differences between the learning processes of ELF/ALF and those of more traditional organizations are of significant interest.

terrorist “front” of a broader ideological movement. These organizations are described in more detail in the Appendix to this report.

In addition, to focus the study on learning behavior, we chose terrorist groups that have a reputation for innovative activities.¹¹ The wide variety of group types selected was intentional—addressing the study’s research questions required examining the relevance and utility of organizational learning theories and frameworks across a range of terrorist groups.

To provide a common approach and structure for the individual case studies, the researcher examining each terrorist group began his or her work with a common set of areas to explore, including the group’s motivations for learning, the areas it chose to learn, the outcomes, and—to the extent possible—how it carried out its learning efforts. The case study process included review of available published information on each group’s learning activities, supplemented by examination of other information sources and interviews with experts in the academic, intelligence, and law enforcement communities who had direct experience with the groups being studied.

- 4. Project workshop.** We invited practitioners from law enforcement and the intelligence community, along with academic experts, to participate in a workshop held concurrently in RAND’s Washington, DC, and Santa Monica, CA, offices on September 29, 2004. Approximately 25 individuals participated in the workshop, where discussions were held on a not-for-attribution basis. The workshop focused

¹¹ Throughout this report, terrorist groups that can learn effectively are contrasted with groups that are not effective learners and, as a result, pose less serious levels of threat. Because of the design of the study, specific groups that learn poorly were not examined in detail and are generally cited as a class rather than as individual groups. Terrorism-incident databases and compendia, such as the Memorial Institute for the Prevention of Terrorism’s *Terrorism Knowledge Base* (<http://www.tkb.org>), provide a range of examples of groups that are poor learners—groups that staged only single types of attacks of limited effectiveness, communicated so poorly that their agenda and intent was difficult to discern, or were rapidly rolled up by security and law enforcement. It should be noted that even terrorist groups that one might consider poor learners overall obviously learned in some areas, but their inability to do so in the areas most critical to their effectiveness limited their impact. Such groups include the following:

- The Tupac Katari Guerrilla Army in Bolivia was active for two years. It had approximately 100 members but did not learn what was needed to maintain its activities after its leadership was captured (<http://www.tkb.org/Group.jsp?groupID=4289>).
- Terra Lliure in Spain disbanded after approximately 20 years, during which it never developed effective strategies to build significant support among the Catalan population it sought to champion (<http://www.tkb.org/Group.jsp?groupID=4281>).
- The Free Papua Movement, partially due to its goals and ideology, did not pursue technologies that would pose a significant threat (<http://www.tkb.org/Group.jsp?groupID=4023>).
- Black Star in Greece, which carried out attacks via two tactics—using gas canister bombs and setting cars on fire—demonstrated neither the interest nor the ability to carry out operational learning in its attack modes (<http://www.tkb.org/Group.jsp?groupID=32>).

A number of other terrorist groups carried out only one or a handful of attacks before disbanding, disappearing, or being arrested without any of their stated goals accomplished. Assessing such groups is difficult, however, as the “new” terrorist groups could be established organizations adopting a cover name for a few operations.

on practical insights into how to improve the design of policies for combating terrorism. Starting with the preliminary results of the case studies, the discussion explored how analytical approaches based on organizational learning might be relevant and applicable to combating terrorism.

About This Report

This report synthesizes the results of the study, combining input from the organizational learning literature, published literature on terrorist and insurgent groups, and insights drawn from the case studies and workshop discussions. Chapter Two describes organizational learning. Chapter Three examines terrorist groups' need to learn in order to change effectively. Chapter Four assesses the utility of understanding terrorist group learning in planning and implementing efforts to combat terrorism and, therefore, contains the core observations that may be most useful to law enforcement and intelligence agencies as they craft programs and operations for combating terrorism. The report does not present explicit recommendations; rather, it outlines a framework that should be useful both for current implementation and for identifying areas requiring further study. Chapter Five addresses the limits of analytical approaches based on organizational learning, and the study's conclusions are summarized in Chapter Six.

Although this report uses selected examples and illustrations from the case studies to support its discussion of applying an understanding of organizational learning to combating terrorism, it does not capture the full richness of detail included in the individual cases. The case studies are described in detail in a companion volume, *Aptitude for Destruction, Volume 2: Case Studies of Organizational Learning in Five Terrorist Groups*, MG-332-NIJ, 2005.

