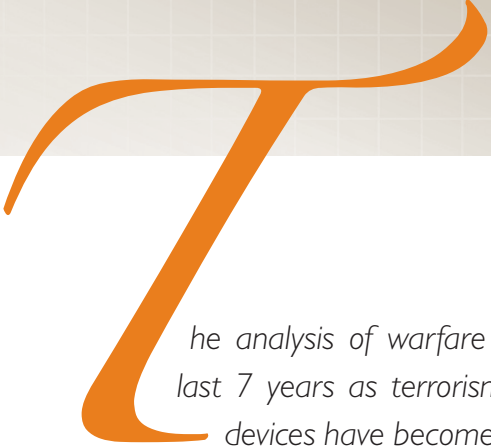# Analysis of Social Movements in Warfare

Chuck Crossett and Ronald J. Buikema

*T*he analysis of warfare has experienced a dramatic shift of focus in the last 7 years as terrorism, insurgency, and the use of improvised explosive devices have become the focus of our operations in Iraq and Afghanistan. Understanding this limited and chaotic form of warfare requires integrating the effects of social systems, from ways to "win the hearts and minds" to comprehending and counteracting the recruitment, training, and support of insurgent fighters. Models of the behavior and motivations of insurgents and their support networks have replaced the simulations of weapon systems and large force campaigns that we have traditionally used in our analysis. This article describes APL's research approach to understanding the impact of social systems on irregular warfare and the different methods we have incorporated to assess the impact of irregular warfare on U.S. warfighting.

INTRODUCTION: THE IMPORTANCE OF THE SOCIAL SYSTEM

Not 10 years ago, an analyst who studied warfare commonly used large simulations to represent the physical aspects of a campaign. The computer would estimate the movement of troops and supplies, assess the effectiveness of a missile against a tank, or even calculate the speed and accuracy necessary for a new weapon to have a dramatic impact on the success or failure of a specific scenario. These simulations included the rules of maneuver warfare, models of the latest technological creations, and equations for the physics of both the environment and the units that existed within it. These simulations did not, however, deal with the social or human aspects of the fighter. Some intelligence assessments or psychological models of military or political leadership did exist. But few analysts had the tools or knowledge to simulate the social and human aspects of warfare.[1]

The emergence of multiple insurgent groups within Iraq, the continuing development and recruitment of radicals ready to use terror to forward their ideological goals, and the resistance of the Taliban in Afghanistan have exposed this missing element within our research and analysis of warfare. Operations in counterterrorism

and counterinsurgency succeed or fail on the basis of human interactions, whether through patrols, training, or locating and targeting specific individuals. Understanding the motivations and behaviors of the enemy participants in this kind of irregular warfare is necessary for developing tactics, techniques, and procedures (TTPs) as well as technologies to combat them. The closeness of the surrounding civilian population to our efforts (as well as to the operations of the enemy) requires that we also understand the population's behavior and likely reactions to any military or insurgent operations.

This type of limited and close-up warfare poses unique challenges for the military. "In [irregular warfare], military leaders need to think politically as well as militarily, and their civilian counterparts need to think militarily as well as politically." Military actions must be balanced to ensure an "enduring political order."[2] Irregular warfare requires a level of organizational agility, operational ingenuity, and political savvy that is generally not emphasized in traditional warfare. Military commanders must consider several options for influencing tactical and operational environments, with physical force possibly being considered in only limited situations. Our officer corps today is expected to understand military operations within the greater context of a whole solution with all actions generally focused on "the people."[3] As can be seen in Fig. 1, interaction with the population is frequent and necessary in this type of warfare.

For APL analysts, the challenge lies in applying traditional warfare analysis methodologies to irregular warfare as appropriate, whether refining methodologies and techniques or developing new techniques. Analysts have also worked closely with government sponsors in discovering what new questions need to be asked, what data must be collected, and what new measures and parameters should be used in this more socially dominant environment. This article details both our approach to collecting data for understanding the social

Figure 1. Key to current U.S. counterinsurgency strategy is interaction with the local populace and regular policing and patrols, either independently or in conjunction with local police forces.

environment and our efforts to build a toolkit to analyze that environment's impact on warfighting.

APL's history of performing warfare analysis goes back to the beginnings of the Laboratory itself. Assessments of the performance of the Bumblebee guided missile and its potential impact on military operations were performed by a central assessment division soon after APL was founded. In 1954, one of the three main priorities of the Laboratory was the "formulation of military problems and assessment of the efficiency of technical devices developed by the Laboratory to solve these problems."[4] A separate department, the Naval Warfare Analysis Department, was created in 1982 to collect the various efforts across the multitude of Navy projects; now the National Security Analysis Department performs this role for APL. Analysts evaluate the effectiveness of new weapons in scenario environments, assess the effectiveness of operational concepts during campaigns, and develop measures of effectiveness and measures of performance for acquisition and technology evaluation programs.

Of course, irregular warfare is not a new concept. The U.S. Army and Marine Corps have a fair amount of experience in dealing with insurgency and limited engagement. From supporting resistance movements during World War II and countering Communist movements during the Cold War, to our full engagement against Communist infiltration in Korea and Vietnam, we are not ignorant of how to understand and operate in an irregular warfare environment. Before the Vietnam War, there was a large effort to develop and formalize the analysis of this type of warfare in parallel with the efforts to mature physics-based warfare that emerged from World War II. In the late 1940s, the Army approached The Johns Hopkins University (JHU) to build a new organization that would be similar to APL and its relationship with the U.S. Navy. A dedicated institution was created within the university that would research and analyze ground warfare, including nuclear and psychological warfare. The Operations Research Office (ORO) was part of the university from 1948 to 1961 and was located in Silver Spring, Maryland, where dozens of mathematicians, psychologists, historians, physicists, and sociologists provided analysis to the Army, both at home and on location in Korea.[5] Examples of their studies are shown in Fig. 2.

As the utility of JHU/ORO's analysis became known throughout the Army, other organizations were created to look at more specific topics. The best known, perhaps, is American University's Special Operations Research Office (SORO). SORO provided social science research for the Army, assessing psychological operations and tactics, researching insurgencies and revolutions, and developing anthropological, economic, and political assessments of foreign countries. From 1956 to 1966, SORO provided the bulk of social science research for the

Figure 2. The myriad studies performed by the social scientists and analysts of JHU/ORO are shown in this graphic from a 1955 brochure.

Army, laying the groundwork for Army Special Forces doctrine and training in insurgency and other irregular operations.[6] But Vietnam marked a dramatic decrease in the Army's interest in analyzing social groups, as well as a dramatic shift of the social science disciplines away from supporting defense-related research and analysis. The small amount of social research provided to the military and intelligence communities thereafter focused mostly on propaganda techniques and psychological assessments of foreign leaders. The analysis of social groups all but disappeared from the military research budget. It would take the emergence of the Iraqi insurgency and resistance of the Afghan Taliban to reawaken the call for social science research and its application to warfare analysis.

THE NATURE OF INSURGENCY

Since 2004, APL has undertaken both internal and sponsored efforts to research, codify, and model social groups with regard to their behaviors, motivations, and interactions within warfare contexts. Specifically, we wish to gain an idea of how social movements such as insurgencies and revolutionary groups are created and how they grow, spread, and sustain themselves and then either survive a counterinsurgency campaign or fail. The dynamics among the movement, the military, and the population at large must also be understood so that we may assess the impact of operations and events.

We have organized our research into a framework of eight specific areas. This structure allows us to compare multiple instances across historical and current movements to draw lessons and to collect empirical data where possible. The framework includes motivation, organization, communications, operations involving violence and/or nonviolent political protest, recruitment, sustainment, legitimacy, and external support. Focusing on these areas should also allow us to study multiple levels of interactions between the groups and their environment, which includes the population, the governing powers against which they fight, and other nation-states or non-state actors.

There appear to be four major types of motivation to form and operate a revolutionary or insurgent movement. The most common, of course, is nationalism, where a particular cultural or ethnic group desires a separate state or equal political power. For example, the Tamil Tigers struggled against the Sri Lankan government to establish a state separate from the dominant Sinhalese majority. Likewise, the Irish Republican Army (IRA) asserted the distinctness of the Irish people from the United Kingdom for decades. A second motivation is to bring about a restructuring of the political system. The mid-20th century saw a worldwide revolutionary fervor to establish socialistic or communist states, such as Fidel Castro's revolution in Cuba, whereas some movements sought to remove the shackles of this collectivist approach to government, for example, the Solidarity movement in Poland.

> **PRIMARY MOTIVATIONS FOR INSURGENCY AND REVOLUTIONARY MOVEMENTS**
> - Nationalism
> - Desire to restructure political system
> - Religious fundamentalism
> - Desire to expel a foreign power or influence

Our predominate research interests are groups that represent the last two motivations. First are those spurred by religious fundamentalism, including the current global Islamic jihad rooted in a desire to remove Western political systems and ways of life and replace them with Koranic precepts. Lastly, we are interested in movements devoted to expulsion of a foreign power or influence, which provided the coalescing factor for the multiple groups fighting the United States after 2003 in Iraq.

These objectives are studied in terms of their underlying political and cultural contexts to assess how the group develops their overall narrative and propaganda. Understanding how the movement sees itself and its purpose and understanding its methods for gaining legitimacy with the population (and even the government) are crucial to countering and deconstructing narratives. How this narrative is used for recruitment and to motivate support for the group is of paramount importance.

Movements adopt different organizational models, typically based on the conditions in which they must survive. Military-style organizations work in environments where the movement can control a large amount of territory or operate undetected within safe zones. But when a government can collect large amounts of intelligence or the social–cultural environment is such that secrecy and compartmentalization is key, the cell-based organization or its variants are used. The Provisional IRA first tried the military-style structure of their predecessor, the original ("Official") IRA, but soon found British intelligence too effective for such direct lines of open communication and consequently moved to a small-unit cellular structure in 1972.

Most problematic to the counterinsurgency efforts are cells that are highly autonomous and emphasize decentralized command and control. For this type of organization, there is often a corresponding overt institution that disseminates targeting ideas, methods, TTPs, and motivational stories, and it may even provide legal and monetary support to participants or their families. Organizations like Al Qaeda are evolving to this type of structure. Other types of radical movements, such as eco-terrorist groups or even the cadre of violent anti-abortion activists, also have used this kind of structure with some success. Massive operations are very difficult to implement within such an approach to organization, but they can have a "mosquito effect" and perhaps even cause a spontaneous revolution.

Most of our empirical data from insurgent movements involve parameters and statistics from their overt operations. We have witnessed the maturation of improvised explosive devices (IEDs) from bombs made from spare parts to highly technical and sophisticated weapons. This trend toward sophistication comes as the social group learns from its previous experiences and also through increased interaction with other groups that possess the requisite knowledge. It usually becomes a necessary path as the countermeasures employed mature, although often at a delay. Using collected data, we have been able to test theories as to whether lethality is the primary objective of the insurgent operations or whether sustained operations are preferred to a high death rate. We can also gauge whether the movement wishes to spread its operations over a wider area to stretch the counterinsurgent forces at the expense of more lethal and denser operational patterns.

Another trend we are studying is the use of nonviolent action. The exclusive use of nonviolent campaigns within some revolutions, such as the Ukrainian Orange Revolution (Fig. 3) or Poland's Solidarity movement, are important cases from which we may assess the impact and usefulness of massive protest, which often constrains the acceptable responses by the military.

Figure 3. Massive peaceful protests, such as those in Poland and Iran and the Orange Revolution of 1999 in the Ukraine (shown here), have toppled governments. The hesitation of the military or police to violently constrain the populace is often a factor in the efficacy of the protests.

Insurgent groups have demonstrated that they are quite advanced in applying emerging technologies to their communications strategy. They can establish "virtual cells" for support of operational planning by using social media websites. Insurgents today can recruit, train, equip, plan, and execute offensive actions—all as part of a cell that they may identify with—without ever having met the other members in person. These virtual cells pose unique challenges because traditional means of defeating the organization may prove ineffective or even irrelevant. In fact, the very basis of decision making, both intra- and inter-cell, has been influenced by the way that irregular forces communicate and share information virtually.[7,8]

The relationship between the insurgency and the population is often noted as the center of gravity for most revolutions, and it is the most difficult to model definitively. The relationship between the two groups—the insurgency and the population—is often highly dynamic, and we have posited a variable of "perceived legitimacy" of the insurgent group to represent this relationship. Does the population believe that the insurgent group has a legitimate claim to authority and a viable political solution? When concessions or a negotiated agreement are on the horizon, perceived legitimacy can either rise or fall, depending on how the population sees the probability of the solution actually working and whether the concessions are viewed as a win or loss for the movement. The operations of both the insurgent group and the military can greatly affect the support of the population toward either side. When violence goes too far, e.g., a large bomb kills many innocent civilians or children, the support for the responsible organization wanes. For example, the bombing campaigns of the Provisional IRA showed that the oscillating support of the Catholic population depended on the egregiousness of the attacks. Often, the IRA was forced to downscale operations while the British intelligence operations would correspondingly thrive.

Recruitment patterns often revolve around the legitimacy of the movement as well as the particular narratives and propaganda messages used by the movement itself. By narratives, we mean the messages that communicate the motivations, grievances, and legitimacy of the objectives wrapped within a cultural, ethnic, or religious context. The movement draws on those contexts to provide a deeper, mission-oriented pull on those looking for better conditions or a purpose in life. Studying the narrative and propaganda being used by the movement can provide keen insight into how the military should shape its own message campaign to counter recruitment and impede the peripheral support network.

We have also been studying the means by which the movements supply and sustain themselves. Often there are sophisticated logistics networks, frequently transiting several countries and even continents for support equipment, weapons, and key personnel. Logistics networks for irregular forces, unlike those for conventional forces, tend to be organizationally linear (by type of materiel) and cellular; to have limited supply, distribution, and production points; and to focus on support for individual fighting cells. The use of safe areas, where the group has freedom of movement and often has a local base of popular support, remains crucial for most movements. For the Taliban forces operating in Pakistan and Afghanistan, these safe areas include portions of the tribal regions and the province in the North–West Frontier. Their current concept of support and their relations with the local populace are not unlike support the Farabundo Martí National Liberation Front (FMLN) received from the populace of Morazán during the 1980s in El Salvador.

To apply these lessons and mental models of the movement to the analysis of warfare, we are using the framework described in this article to construct and test various metrics that would both improve our models and perhaps provide some eventual validation. This approach allows us to advise our government sponsors on possible data collection avenues and on measures of effectiveness and measures of performance to consider during long-term operations. Traditional effectiveness measures based on attrition of enemy forces are not transferable to counterinsurgency or counterterror operations. More subtle and dynamic measures must be developed and evaluated.

ANALYZING IRREGULAR WARFARE

We have taken a two-pronged approach to building a capability that will allow us to analyze the impact of social movements in warfare. The first is a research approach to gather data and build an understanding of the foundations of social movements and the dynamic behaviors within them. As stated in the preceding section, we built a research framework to organize various aspects that contribute to the behaviors we considered crucial to building an analytic capability. We were able to use some of our traditional data collection methods to begin this research but had to augment them with some new or greatly revised approaches to satisfy our data needs. We also had to pursue a second development effort, that of building new models and simulations to utilize this research. This capability is still nascent but is now able to support sponsor needs on many projects.

In support of the Joint IED Defeat Organization (JIEDDO) and other sponsors, APL analysts have developed techniques to organize and then sort through massive collections of event reports and measured variables. The analysts then developed methods to use these data to build an understanding of how the insurgencies emplace and detonate the explosives, as well as to assess how materials and chemicals are applied to manufacture and emplacement. APL used pattern analysis and our

understanding of social–cultural factors to improve the military's ability to sense and monitor the entire end-to-end IED process.

The Army has recently instituted the Human Terrain System, including teams of social scientists embedded within the deployed units in various operational areas. The data collected from these teams has aided the assessment of specific sociocultural responses to operations of both the Army and the insurgent (see Fig. 4), along with understanding of the impact that such knowledge can have on the military decision-making process. APL recently evaluated technology for U.S. Central Command (CENTCOM) that would provide a common "map" of the human terrain based on the databases from those teams and other sources.

A new venture for APL is the use of historical analysis to assess and research behaviors and operations of social resistance groups.[9] We are presently building a textbook of 24 case studies of insurgent and revolutionary movements for the U.S. Army Special Forces. This set of case studies, spanning 1962 to the present and originating from all regions of the world, utilizes the research framework discussed previously to lay out a detailed understanding of each movement during its existence, focusing on its internal operations, networks, and organizations, rather than on the battles and events that are usually considered the "revolution." From this historical research, we are able to build a fundamental understanding of the various methods by which a movement may begin, expand, operate, and eventually succeed or fail. Lessons can be drawn across the multiple cases or can be used to show various trends through the latter part of the 20th century and the beginning of the 21st century. This historical analysis has also grown to begin assessment of the future potential paths of insurgent and revolutionary movements, from the decentralization of the command and control function, to the implications of high-density unemployment of young males, and even

Figure 4. Understanding and incorporating local social and cultural customs, laws, and traditions has become a new yet useful way in which the United States has learned to interact with the local leaders and support host-country and U.S. interests by gaining population support.

to the use of women and children in irregular warfare operations by the enemy.

History and collection of data on current operations can only bring us so much insight, however, and we fill in specific gaps in detailed knowledge, or develop a broader understanding of the political and socioeconomic conditions, through the engagement of subject-matter expertise in controlled exercises or workshops. APL has conducted numerous country-specific workshops where academic and military experts with regional knowledge have been brought together to create a description of the current state of affairs, internal and external pressure points, and dynamic external conditions that may affect the situation. We have also used our Warfare Analysis Laboratory facility to engage and elicit subject-matter experts for multiple sponsors, including the Army's Asymmetric Warfare Group, the Office of the Secretary of Defense's Cost Analysis and Program Evaluation Office, and JIEDDO. Through facilitated discussions, scenario walkthroughs, and formal modeling exercises, we have assisted our sponsors in collecting and analyzing a vast array of expert opinion and assessment to fill the void of empirical data.

A more structured and formal analysis using subject-matter expertise is the use of group gaming techniques. APL is developing the capability to construct and execute large multiday exercises based on a fictitious scenario (see Fig. 5). Participants are grouped into teams, traditionally representing the threat (Red team), the Allied or U.S. team (Blue team), and neutral factions, other states, or even the surrounding populace. These scenarios, played out in multiple conference rooms configured for such events, allow multiple "moves" to permit the feedback of participant decisions to affect the other teams' options and choices. The event involves not only collection of data on the outcomes of the individual moves and the overall outcome but also collection of the decision processes and options considered by each team.

Although this may sound similar to a traditional "wargame," APL's gaming approach allows nonmilitary aspects to be incorporated and even to dominate the game itself. Many recent efforts have emphasized diplomatic, information, military, economic, financial, and law enforcement (DIMEFIL), that is, the elements representing traditional state power, for examining irregular threats. Frequently in such events, military power is the least emphasized, and when it is considered, nonkinetic actions are most likely selected. DIMEFIL also provides a means of categorizing possible Blue-force actions, targeting specific, identified irregular threat vulnerabilities. Competitive strategy events provide a structured means of examining actions and decision making against a "thinking" adversary, then capturing quantitative and qualitative data that can be analyzed and provided to the sponsor. The games have included looking at possible emerging threat organizations, areas of interest,

Figure 5. Turn-based games that incorporate operations and/or considerations other than military options are now a key way by which APL studies the effects of irregular warfare and collects data on the potential effectiveness of concepts.

or functional areas, such as logistics support and intelligence, surveillance, and reconnaissance. In the past 36 months, a common theme has clearly emerged from our APL sponsors: focus on irregular threats and consider the implications of irregular warfare in doctrine, equipment, and concept of operations.

Our development path for analytic tools that incorporate social influences and behaviors also emphasizes the need for a new set of models and simulations. The approaches described in the other articles in this issue will benefit from the data and mental models we have built of insurgent and social movements and also will aid in our end analysis of how these movements affect a military operation. Social models such as the Green Country Model (see the article by Bos et al., this issue) can simulate the effects of operations on the basis of known or estimated sentiment and loyalties (or both) within a population or social group. This model can utilize our understanding of movement dynamics and motivations and allow the analyst to test various tactical approaches or operational concepts. It can also be used as a simulator during a gaming exercise to represent the population's reactions to moves made by friendly or enemy forces.

Validated predictive modeling is perhaps still a distant possibility, but this multidisciplinary and methodological approach to building a capability to analyze social groups has allowed us to make substantial strides in our support to sponsors across the spectrum.

APL's ongoing analysis of irregular warfare has applicability to several other more traditional projects. Analysis of asymmetric threats has resulted in refinements to combatant command operational plans and their considerations of unconventional and unanticipated enemy actions. For other projects, risk management has been reevaluated with consideration of irregular threats. Some sponsors have requested a reassessment of operational

planning assumptions on the basis of lessons learned about potential adversarial actions in an asymmetric warfare scenario. Military utility assessments have shifted areas of emphasis and evaluation techniques on the basis of irregular warfare analysis, considering emerging adversarial capabilities as well as nontraditional Blue actions. Irregular warfare even influences APL's support to the Armed Services in conducting manpower assessments, since responding to irregular threats may require changes to the force, from both manpower and systems perspectives. Our efforts in modeling, simulation, and analysis have also considered irregular warfare and the evolving roles and missions of the intelligence community, DoD, and the Department of Homeland Security. Frequently, APL analysts are engaged in analysis efforts supporting an interagency response, not one single entity. This is also directly related to how we are prepared to fight in the complex irregular warfare environment. Finally, the interagency approach has also resulted in APL analysts considering new methods of information sharing across traditional civil–military domains, as we consider the means to function more effectively, even in a crisis environment.

THE FUTURE OF SMALL GROUP WARFARE AND ANALYSIS THEREOF

Our efforts to understand the behaviors of both the core movement membership and its support network undoubtedly lag behind the evolution of operations, TTPs, and capabilities. Therefore, we have tried to assess potential paths of development that will lead to large changes in behavior and improvement in the group's effectiveness. By looking for possible trends, we intend to accomplish two things. First, we hope to be able to quickly recognize changing conditions that indicate the movement might be headed down a particular path. Having metrics that will sense this change in direction allows us to respond quickly and not lag further in our understanding and capabilities. Second, by forecasting particular future paths of organization, recruitment methods, technology, TTPs, etc., we can assess whether the analytical methods that we are currently pursuing will be relevant, or can be tailored, to those new conditions. We wish to know whether our analytical toolkit can pace the movement's evolution.

Three potential major shifts have been identified. First, the ultraviolent combination of criminality and political influence of the drug cartels in Mexico and Central and South America may influence, if not merge with, other more revolutionary interests. The longstanding survivability of the cartels and more directed violence that they employ may benefit a movement that expects a long-term, broad struggle. Also, the increasing number of movements that are motivated as much

by monetary and economic gain as by political power already shows that our current understanding of how to counter the allure and recruitment of these movements may be outdated.

Second, we believe that some movements will utilize a more nonviolent and protest-oriented strategy, merged with infrequent but spectacular violent operations. This combination of tactics will make it more difficult for the counter-operations to distinguish and employ low-casualty tactics. Activist and criminal groups are now commonly using diversionary peaceful activity to draw attention away from the central violent operation.

Last, we have begun to study the effect of movements that are not organized in any centralized fashion. The so-called "leaderless resistance" has been a much discussed and anticipated concept, but its impact and ability to attract large numbers of self-proclaimed "revolutionaries" that will spark a spontaneous uprising have been limited to date. However, the global reach of person-to-person communications and the instant distribution of manifestos, target lists, tactics guides, and bomb and explosive manufacturing instructions via the Internet lead us to believe that self-run individual or small-cell operations guided by a distributed ideological movement have the potential for being more effective than earlier such leaderless movements, making this phenomenon of potential interest for research.

CONCLUSION

The ability to model and predict the behavior of social systems will not be able to replicate the fidelity or certainty of models of physical systems in the near future. Even so, at APL and elsewhere large advances have been made toward characterizing the motivations and behaviors of social groups and the movements that are of concern in insurgencies and revolutionary movements. Continuing on-the-ground data collection, gleaning more lessons from historical research, and using experienced human input and behaviors within our beginning models and analytic games will allow us to improve our ability to assess operations in such irregular environments. We are also incorporating these methods in more traditional forms of warfare analysis. Sociocultural understanding, interagency operations, gaming approaches, and historical studies can assist our full-force assessments, military utility assessments of technology, and our future warfare trends research.

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