

## Day 1- April 3, 2006

### **Dying to Win: The Strategic Logic of Suicide Terrorism** - Robert Pape, Department of Political Science, University of Chicago

Pape discussed the Chicago Project on Suicide Terrorism and provided an overall analysis of its findings, which support the notion that suicide terrorist attacks are not conducted to serve some religious fundamental goal, but rather have a secular and political goal of compelling modern democracies to withdraw their military forces from territories that the perpetrators view as their homeland. Based on this, he maintains that solely military responses are not the answer. Though such operations may result in some “success” in the short term, they do not address the underlying root cause of the attacks, and can perpetuate such occurrences in the long term (i.e. revenge). A response will need to be multi-faceted to include improved homeland security, greater involvement in nation building, and increased energy independence.

Pape also refuted some other common misconceptions about suicide terrorists. Suicide terrorism is not primarily a product of Islamic fundamentalism. The Tamil Tigers, a secular group with a Marxist ideology, for example, has conducted more attacks than any other group. 95% of the attacks since 1980 are part of a larger campaign by militant organizations with significant public support. Every suicide terror campaign has had the goal of compelling modern democracies to withdraw their military forces from a territory. For example, Al Qaeda-affiliated suicide terror attacks in Saudi Arabia fit this profile (expulsion of forces from Persian Gulf). Suicide terrorism is on the rise because terrorists have learned it's effective. The US, among other democracies, makes concessions to suicide terrorists. Suicide terrorists are not mainly men who are poor and uneducated. They are largely politically active, from middle class backgrounds, with high school or college educations (some in fact, are teachers). Some are also women (examples were given from India, the IRA and Palestine).

His source for these conclusions is a review of his 400+ entry data set of all suicide terrorist attacks since 1980 until 2004, which leverages such diverse sources as terrorist

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group documents/literature, lists of terrorist groups from US and foreign governments, government publications, media reports, and international field research in Beirut and Cairo. Each source of information had to be verified and corroborated by at least two other sources for it to be included into the data set.

Interesting insights from the Q/A includes:

- Suicide terrorism database and analysis can aid in threat anticipation in two ways:
  - help ground troops, the COCOMs (Combatant Commanders) and others to better understand some of the possibly threatening conditions in their AOR (Area of Responsibility), based on historical precedence of suicide terrorism
  - help predict campaigns (but not single attacks)
- The case was made that suicide terrorism with WMD is unlikely. If a group acquires one or a few nuclear weapons, they will still be a rare asset that the group may or may not want to strategically use.

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### Day 2- April 4, 2006

**Welcome** - Kathy Morrison, Director, Center for International Studies/Professor of Anthropology, The University of Chicago and Charles Macal, Director, Center for Complex Adaptive Agent Systems Simulation, Argonne National Laboratory

In a welcome statement, Morrison and Macal discussed the workshop's objectives and provided a brief overview of the Joint Threat Anticipation Center's goals, history, and ongoing and upcoming efforts. The overview included an explanation of the graduate research initiative, its information-sharing efforts (web site, mailing list), the student and faculty research efforts, and Argonne's work on validation and verification of computational social science modeling.

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**Welcome** - Richard Gullickson, Director, Advanced Systems and Concepts Office (ASCO), Defense Threat Reduction Agency (DTRA)

Gullickson provided an overview of DTRA's mission and structure and highlighted some of ASCO's recent efforts, including those conducted under the rubric of the Threat Anticipation Project. He referenced the importance of threat anticipation given both the National Security Strategy and Quadrennial Defense Review's focus on the need to understand our adversaries and on addressing four threat challenges- irregular, catastrophic, traditional, and disruptive. JTAC contributes to this effort of enhancing understanding, and from a DTRA perspective, supports the campaign for global situational awareness.

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**Regional Centers of Excellence - Academic Defense Against Bioterrorism** - Olaf Schneewind, Director, Great Lakes Regional Center of Excellence for Biodefense and Emerging Infectious Disease Research (GLRCE)

Schneewind articulated the GLRCE's mission to provide basic research for biodefense in response to federal initiatives. His center's efforts are focused in three preventative areas related to microbes: therapeutics, vaccines, and diagnostics. His center is not specifically involved in bioterrorism prevention and response, but serves as a resource to inform national security responses and policies. He referenced some of the bioterrorism threats to the United States and other nations from Class A toxins (plague, anthrax, smallpox, hemorrhagic fever, tularemia, and botulism) and opined that certain diseases such as Marburg, Avian flu, SARS, are considered to be threats because of their largely unknown societal impact. Angola's recent experience with the Marburg virus was cited as an example.

Largely, his talk analyzed four of the class A agents that could be used in a bioterrorist attack- smallpox, plague, anthrax, and botulism.

- Smallpox is a threat because, without an effective countermeasure, quarantine cannot be implemented. 1 in 1000 people has an adverse effect to vaccination and in the US today that is not tolerated. This can have an impact on how we can respond to and prevent infections. Smallpox is also a threat because it spreads rapidly. The results of the Dark Winter smallpox attack simulation in 2002 were presented, highlighting the high rate of infection spread across state boundaries, even with a localized attack in a shopping mall.
- The rules of engagement are different for plague because it starts with an animal infection. Transmission can come from a flea bite or inhalation. Protection is the most challenging element, as evidenced by the rapid spread of infections in a TOPOFF exercise in a Denver concert hall. Adding to the threat is the idea that plague samples are readily found in nature (fleas on prairie dogs).
- Anthrax is a threat to be aware of because some strains are resistant to antibodies. In its natural form, anthrax is transmitted via spores. In its weaponized form, it can be aerosolized. The inhaled form can be lethal within 48 hours. The anthrax vaccine's effectiveness is still being documented.
- Botulism can be transmitted orally or through inhalation. One of the problems with this agent is that an infection results in long-lasting respiratory paralysis (6 months). In this case, a countermeasure would be the availability of respirators. However, we need to consider that these are limited in number across a state. Also, there is no botulism vaccine.

Schneewind then offered the insight that the real goal of his basic research in the national security realm is the development of vaccines against these agents and methods to detect such toxins in the aftermath of an attack. Real time detection would be ideal. The US response to disease outbreaks has changed over time. Today, we tolerate infectious disease less than we did years ago and adverse effects of vaccines are not welcome, making response and prevention a challenge.

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**Poverty, Inequality, and Terrorism** - Robert Townsend, Charles E. Merriam Distinguished Service Professor in Economics, University of Chicago

Townsend briefed his ongoing efforts to conduct a case study on Thailand to better understand poverty as one precursor to local terrorism. Partly funded through JTAC monies, he has conducted extensive, original field survey research to serve as the data basis for economic models which assess the impact that formal and informal financial systems have on Thai households and their well being. The models also use existing standard survey data. These models are being developed to assess the impact that economic policy intervention would have on the experience at the household level. The models look at the degree to which the households have access to infrastructure (roads) and how wealth is created (which is sometimes uneven) and what would happen if new roads were created. This is an attempt to better understand how underlying economic forces can or do contribute to the fueling of separatist violence. Separatist violence is a primary concern in southern Thailand and it is thought to be driven by economic factors. By looking at the local level, one can determine, for example, what villages potential terrorists could come from. Townsend maintains that the insights garnered from the models can be applied more generally in similar circumstances around the world.

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**An Emotive Dictionary of Conflict Terms** - Ilai Alon, Visiting Professor, Department of Near Eastern Languages and Civilizations, University of Chicago

Alon discussed his ongoing JTAC funded research and highlighted the benefits his research had for the government. The objective of this effort is to create an accessible dictionary of the emotional content of Arab Palestinian terms related to conflict. Unlike other dictionaries, this database does not seek to translate the Arabic terms into English but highlight the terms' meanings in such a way that they are not restricted to the cognitive sphere, but also include emotional context. The Arabic language (Palestinian

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dialect) is largely indicative of the Palestinian's national and religious identity and culture. To better understand them, one needs to understand their culture.

To develop this database, Alon is assessing what constitutes emotion and terms of conflicts for Arab Palestinians. He developed a 2 phased questionnaire to be used in a survey. The document lists a variety of emotive terms (love, tenderness, faithfulness, hope, fraternity, etc) and conflict terms (racism, hatred, co-existence, peace, etc) and asks the participants to develop meaning. They will then "grade" the conflict terms with the emotion terms. The survey results will be used as the basis for the database.

Alon would like to see this work help the military finesse their use of terms (capture subtleties) so that they adequately express what is needed to allow the receiver to fully understand the message.

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#### **What are National Security Threats? - John Mearsheimer, R. Wendell Harrison**

Distinguished Service Professor of Political Science and the co-director of the Program on International Security Policy, University of Chicago

Mearsheimer provided an assessment of the threat environment for the next 20 years. His remarks were confined to direct military threats and centered along three lines: threats from the great powers, threats from rogue states with WMD, and threats from non-state terrorists. However, he reminded the audience that non-military threats do exist (e.g., genocide, global warming).

He defined "great powers" as those countries that have the economic and military capacity/capability to be a potential peer competitor to the US and project power to other regions. The US has no peer competitors today and for the immediate future. China and Russia are considered to be great powers but are still weak in comparison to the US. China is rising, with its population 5 times that of the US and its wealth projected to be 2/3 of the US GNP.

Mearsheimer defined “rogue states with WMD” to include Iran, DPRK, Syria, and Iraq under Saddam Hussein. These states are not direct threats to the US. The threat posed by these states to the US is overblown by the current administration and national security experts. They do not have the offensive capability to attack the US. Those states want WMD because they are the best deterrent against any US military actions.

There are four dimensions to this threat:

- States using WMD as blackmail - Implausible/not good idea, since the US also has nuclear weapons there would be a credibility problem.
- States threatening use when US military forces try to conquer them using conventional means - This would involve the use WMD as a shield. It is important to note that Saddam Hussein would only use WMD (if he had any) if his survival and the survival of his society was in question.
- States threatening use to deter US influence.
- States transferring WMD to terrorist groups - Unlikely because states would never be confident that the transfer could not be detected and traced back to them, making it a very high risk activity.

The non-state actor (NSA) is the real threat in the current and future threat landscape. The real threat is Al Qaeda. The Global War on Terror (GWOT) needs to be focused only on those organizations that threaten the US because terrorism is not a seamless web. Hezbollah, Hamas, and the Islamic Jihad are not the US's problem. Al Qaeda is the prominent adversary here. With regard to the terrorist problem in Iraq, one needs to remember that terrorism was not a problem before the US invaded and occupied the territory. The two explanations that are often given on why these NSAs hate the US are that they hate the US for who the US is (clash of civilizations) or for what the US does (US policy, occupations, support for Israel, use of sanctions in the 90s in Iraq). Polls and anecdotes suggest that they hate the US more for what the US does. Mearsheimer answered the question of whether al Qaeda is an immortal enemy by stating that they would not be hard to deal with since it is difficult for them to acquire and use WMD. He argues this point with the previously mentioned notion that states don't like non-state

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actors that give them trouble. Al Qaeda is a threat in that it could bring down governments.

Interesting insights from Q/A includes:

- The greatest non-military threat is global warming/environmental.
- Nuclear weapons are the greatest WMD threat because of their cascading psychological effect on society. They also cause greater physical damage than the chemical or biological varieties. Biological weapons are a threat, but they are hard to develop to the degree that they can cause widespread destruction.

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**Microfoundations of Insurgent Violence** - Mark Smith, Ph.D candidate, Department of Political Science, University of Chicago; Janine Davidson, Director, Counterinsurgency Studies with the Center for Adaptive Strategies and Threats, Hicks and Associates, Inc.

Smith and Davidson focused on the micro-dynamics of insurgency and counterinsurgency. The fight between insurgencies and counter-insurgencies is seen as fought through the civilian population, where most violence is against civilians. While most of this insurgency is dismissed as criminal activity by the media and counterinsurgents (i.e., the U.S. in Iraq), a lot of the seemingly indiscriminate violence (e.g., suicide car bombs) is strategic. Activities such as the caching of weapons, recruiting fighters, punishing government collaborators, collecting taxes, etc. tend to be public at the local level, with the effect that civilians supporting the government will not collaborate because they do not feel safe from insurgent retaliation. Civilian micro-decision models can show why insurgency overwhelmingly favors the insurgents over the counterinsurgents.

For a successful counterinsurgency, one needs to "multiply" the effect of counterinsurgency. This can be done by directing efforts at changing civilian perceptions



and expectations. It is also important to be very selective in targeting insurgents (i.e., avoiding false positives), in order to convey the image of a well informed governing entity. Another way to create stability and earn the confidence of the civilian population is by building political, security, economic and social institutions simultaneously. Smith and Davidson suggested that good counterinsurgency looks like good police work.

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**Attachments to Land and Interstate Conflict** - Jenna Jordan, Ph.D Candidate, University of Chicago

Jordan's talk looked at when states give up their territory and the role of political discourse in affecting those decisions. The potential use of her research effort is that it can inform projections of where existing conflicts over land might end up and therefore affect policy. At a more fundamental level, her research can provide a theoretical understanding of the bases for land attachment. To develop this project, she is conducting an ongoing literature review to assess empirical trends in territorial disputes in the modern era. Most territorial changes have been the result of war but there is a need to explore why some changes of borders result in violence, and why others do not.

Based on the review of historical data since 1815, she surmises that the degree of violence associate with territorial change has to do with the type of attachment that the group has to the land. Jordan outlined three variables that affect the decision on whether or not a state gives up territory, and if that exchange is violent or non-violent.

The first variable is symbolic or strategic attachment to the land. If the land has some symbolic meaning, entities are less likely to give up territory than if there is no symbolic meaning. Attachment to land can also be strategically-based (access to commerce, water, and other needed resources). The type of attachment is reflected in political discourse. This discourse can be from the elites or the masses, but whatever discourse is most dominant will affect the decision to give up land. The second variable is the exclusivity of boundaries. A good example of this is the case of Jerusalem, where rights to a certain territory come into question. These arguments of "rights" often serve as

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origins for international disputes. The third variable is national identity. Discourse involving identity questions can be a good way to sustain efforts to keep a territory. If a group identity is partly derived from boundaries, this land can be a way to sustain solidarity among a group. In this regard, border configuration is important, as well as how those decisions are made.

Jordan hypothesizes that if there is exclusivity of boundaries and there is symbolic attachment to that land, a state will not give up territory and cession is not likely. This type of dispute is the most violent and most likely to result in military conflict. If there is exclusivity of boundaries and the land is strategic, states will fight over the territory until it is cost prohibitive (ranked second in violence level). If there isn't exclusivity of boundaries and the land attachment is strategic in nature, states may fight over territory, but cession is possible (third in violence level). Lastly, if the land is symbolic but there is not exclusivity in boundaries, cession is most likely (fourth in violence level).

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**Policy, Behavior, and Weapons of Mass Destruction in the Crucible of Strategic Culture: An Initial Framework for Comparative Analysis** - Jeffrey S. Lantis, Associate Professor of Political Science, College of Wooster and Kerry Kartchner, Defense Threat Reduction Agency, Advanced Systems Concepts Office; Discussant: Joseph Masco, Professor of Anthropology, University of Chicago

Lantis discussed the evolution of the study of comparative strategic cultures by providing an overview of the literature.

Kartchner discussed the ways in which strategic culture can be policy-relevant, especially in cases involving WMD, by outlining his ongoing DTRA/ASCO-sponsored effort to develop case studies and other explanatory essays on this issue. (These will eventually be part of a curriculum package.) He highlighted one of the major hurdles in making the case for the role of strategic cultural understanding in policy decisions as

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### April 3-5, 2006 - What Are National Security Threats?

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learning how to frame the information in a way that is useful to the policy makers dealing with political realities.

Masco discussed Kartchner's undertaking with reference to his ongoing efforts to look at the long-term consequences of the US's nuclear efforts, specifically for those living around the Los Alamos community, as well as the effect of exercises such as the Manhattan Project on the long-term logic and rationale of the US's national security decisions (means of coordination, attitudes, how/what institutions are built). When looking at the issue of WMD, he suggested that we consider proliferation not only in terms of material, but also in terms of expertise. Activities involving WMD can link people across general areas of expertise and one needs to understand how those processes come together and how communication is conducted, and what that means in terms of decision making. Masco also discussed the US's current national security culture and suggested that today it is largely informed by the counter-terrorist campaign. Whatever security debate is the most dominant will inform the national security culture at any given moment. That "cultural notion" flows down into the masses through mass media. Therefore, how popular support for a government agenda is mobilized is an important area to analyze.

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### Day 3- April 5, 2006

**Counterforce Revisited** - Charles Glaser, Professor, Harris School of Public Policy, University of Chicago

Glaser provided an overview of current US nuclear doctrine and its purpose in assuring, dissuading, deterring, and defeating proliferators. He then offered several critiques of the Nonproliferation Review (NPR) in the area of force size, the notion of no first use, ballistic missile defense, and counter WMD missions. He highlighted some of the, in his opinion, suspect arguments on the use, utility, dangers, and benefits of nuclear counterforce against nuclear targets, mobile targets, and chemical and biological (CB)

## The 2<sup>nd</sup> Annual Joint Threat Anticipation Center Workshop Conference Report April 3-5, 2006 - What Are National Security Threats?

For presenter bios, audio recordings, and PowerPoint presentations, visit <http://jtac.uchicago.edu/conferences/06/>

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targets. Glaser also provided an overview of the potential benefits of the counter-nuclear mission: the difference in logic of Cold War arguments (nuclear use against a small arsenal differs from the logic of MAD); deterrence of limited attacks (destroying adversary's weapons- US has the overwhelming capability); damage limitation in a crisis with future uncertainty (move from a conventional war to a nuclear one) because one can't deter everyone and deterrence can fail; and protection of US foreign policy. He also provided a discussion of the potential costs of the counter-nuclear mission: it can fuel proliferation (acquisition of nuclear weapons by adversaries); it can weaken barriers to proliferation and the nuclear taboo (incentives to proliferate); and it can increase force structure requirements. To conclude, Glaser reminded the audience that we need to consider the cost implications of this mission but also recognize that deterrence will mostly work.

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**Automatic Machine Translation from Poorly Studied Languages** - John Goldsmith,  
Professor, Departments of Linguistics and Computer Science, University of Chicago

Goldsmith's research, which is partly funded through JTAC, seeks to meld advances in linguistic science and computer science to develop a tool to better understand the structure of languages that may not have received significant attention. He began his presentation by providing an overview of the historical progress of computer development in linguistically-related areas. In the 90s, for example, there was a change in computational linguistics based on data-driven statistical techniques (i.e. statistical machine translation that allows for word to word matching and common word alignment). In 1999, a breakthrough occurred with the Egypt project, which provided a platform for an easy to use mechanism to not just translate sentences, but also provide a way to understand sentence construction (how words are patterned/ordered), which can vary from language to language, and result in "null" translations (e.g., "le chien", translated into English, would result in the "le" being a "null"). The University of Chicago project (Linguistica) is using this platform to create a pathway for users to learn complex structures of languages (understand the grammar) and can address difficult compound words (i.e. the morphemes within a word), and how those words correspond to one

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For presenter bios, audio recordings, and PowerPoint presentations, visit <http://jtac.uchicago.edu/conferences/06/>

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another across languages. It is seeking to create an automatic mechanism to analyze morphological structures and is now being tested on Swahili. Currently 20,000 words can be analyzed in about 15 seconds. This project can play an important part in improving language awareness in foreign situations and, in doing so, would improve understanding of larger cultural issues as well.

Interesting insights from the Q/A:

- Software can work with mixed languages (i.e. a mix of Kurdish and Iraq) because the computer does not know that the languages are mixed.
- Goldsmith would like to look at a “non-standard” dialect of Arabic. The matter of getting this data is not trivial.

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**Introduction to Modeling** - Charles Macal, Director, Center for Complex Adaptive Agent Systems Simulation, Argonne National Laboratory

Macal presented an overview of the upcoming sessions on computational social science modeling and provided some insight on how the structure of the talks related to the larger JTAC efforts of integrating the computational and social sciences for the purposes of improving national and international security.

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**Assessing Threats and Risks: A Wickedly Complex Problem** - Nancy Hayden, Sandia National Laboratory

Hayden suggested that any effort to develop models to assess threats and risks should take the analyst's perspective into account, as in how the analyst can achieve their mission and how the models can be useful in making sense of large quantities of data. The increasing awareness of these types of efforts is reflected in the QDR. "Strategic

communication" and "risk management" for decision making regarding threats and risks was not mentioned in the 2001 QDR, while those terms appeared 8 times in the 2006 version. The central issue is that we need to understand the complexity associated with conducting assessments of threats and risks. Local issues can drive larger problems and attempting to solve one problem (threat) may give rise to another, or be symptomatic of a deeper rooted problem. To this end, we need to better understand the structural complexity of threats. Complexity science, then, has much to offer in this vein.

The notions of emergent behaviors (surprises, outliers, etc.), multiple scales and time frames, and the meaning of structures (sociological meanings) and their associated challenges should also be considered. The purpose of any analysis has to be thought out. Is it at a systems level or a smaller level? Are we looking at current issues or impact for the future? When conducting analysis, we need to know whether we are looking to describe, interpret, explain, explore, or project. Any methods used will be largely impacted by the intent of the analysis. We also need to consider whether the analysis is for academic purposes or is being conducted at a more operational level.

Hayden then discussed terrorism as an example of this emergent phenomenon where threats and risks need to be considered using these methods. She suggested several tools that have or could be useful in conducting these assessments: agent based modeling, cognitive modeling, and ideological trend analysis. A quick review of one year of peer reviewed literature in the social sciences suggested that only a few theoretical social network analysis and agent based modeling research efforts had been conducted with terrorism in mind in academic contexts (this did not cover work in the Department of Defense or in the intelligence community). This would suggest why we don't have the knowledge required to adequately remove unnecessary complexity and gain clarity needed for insight and action on the terrorism front.

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**Introduction to Modeling** - Charles Macal, Director, Center for Complex Adaptive Agent Systems Simulation, Argonne National Laboratory

Macal provided an introduction to computational social science modeling. He suggested that modeling is helpful because human beings are constrained by linear thinking, and we cannot imagine all possibilities, foresee the full effect of cascading events, or foresee novel events. We model, then, for insights and explanations. The notion that modeling can help us make qualitative or quantitative predictions about the future is problematic in the decision making context. Modeling, however, can aid in decision making efforts. Modeling approaches range from being descriptive to being social process-oriented. The continuum could contain the following: accounting, statistics, social network analysis, dynamic social networks, system dynamics, and agent based modeling and simulations. Descriptive approaches (not really models) rely on inductive inference and are data-driven. These include text processing, probabilistic inferencing (Bayesian approach), and data mining to see structural relationships (i.e. Indasea's Cultural Simulation Model). Macal proceeded to suggest that investment in network science is both a strategic and urgent national priority.

Rational choice economic models and agent based models are examples of models that look at social processes. A small model can take into account essential elements of the real world, while a larger, complex model looks at as many characteristics as possible. Macal suggests that the best technique for dynamic multi-level cultural modeling is through the agent-based approach. Agents, which have individual attributes and decision mechanisms, interact with one another. An example of this approach is found in Ed Mackerrow's MAS Model, funded by DTRA/ASCO.

Macal then highlighted the essential importance of validation and verification. Verifying a model is making sure that it works as intended (i.e., that the code is not buggy) while validation involves seeing whether the model accurately reflects the empirical realities of the phenomenon under investigation. Argonne National Laboratory and The University of Chicago are currently conducting several efforts in this area, the Argonne Validation Sciences Initiative (VSI) being such an effort. He highlighted several possible elements of a validation framework for computational social science models (case studies, e-laboratory, use of multiple models, and use of subject matter experts).

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### **Interweaving Modeling and History**

**Mechanisms of Occupation and Resistance: Lessons from the British in Iraq** - Daniel Barnard, Instructor, United States Military Academy at West Point, and Ph.D Candidate, Department of History, University of Chicago

To begin this panel of how historical analysis and modeling can be integrated, Barnard discussed mechanisms of occupation and resistance by exploring lessons from the British in Iraq. He mentioned that in order to anticipate future threats, it is important to know what happened in the past and find the best parallel possible to one's current situation. He highlighted the evolutionary aspect of insurgency by examining what the British faced in 1919 where their occupation of Iraq resulted in an insurrection. He developed a taxonomy of that insurgency and suggested that insights could be applied in the current Iraqi context. An examination of class stratification can lead to an appreciation of insurgents' motivations. He maintained that nationalism is a complex issue in Iraq. An understanding of the existing divisions is important to understanding the insurgency problem. The divisions are not simple ones such as urban vs. rural or Sunni vs. Shiite. They are more complex than that. Additionally, he suggested that any modeling effort of the problem should not focus solely on the leadership but also track other important elements. Oftentimes, the aims and stakes of the leadership can be different from those of the insurgents.

**Solidarity/Occupational Dynamics Modeling** - Keven Ruby, Ph.D Candidate, Department of Political Science, University of Chicago

Ruby then discussed his research effort to build a baseline model for understanding occupational dynamics, an effort informed by his social science research in this area. Although his project does not deal with insurgency directly, studying occupation involves understanding similarly complex issues. His model of occupation investigates the



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relationship between the publicly observable levels of compliance with occupation and the private and mostly unobservable "hearts and minds" of those affected. His model looks at the interrelations of the occupation authority, the occupied public, and the counter-authority as it relates to sanctions, and support for the occupation. The individuals that are part of the occupied public are the agents and what they feel may be different from what they demonstrate to authorities on both sides. They have a network of friends and enemies and their actions are informed by those network relations. The authorities compete with one another and are the external drivers in the model. They have various strategies they can employ to gain support and enforce sanctions. The model looks at these decision making processes and Ruby suggests that the three end results of a simulations could include polarization, struggle, or victory for each of the authorities. Preliminary results seem to suggest that strategic choices seem to matter more for the occupation authority than the counter authority. In the future, he plans to add other elements to the model to investigate how identity in group formation can affect the dynamics and interaction processes.

**Discussant** - Jonathan Ozik, Post-doctoral Fellow, Joint Threat Anticipation Center

Ozik indicated that the interweaving of modeling and history is one example of the interdisciplinary research that JTAC does to integrate the computational and social sciences/humanities. He highlighted the importance of establishing common frames of reference for the disciplines. A term, theory, or concept can mean one thing to the computational scientist and another to the social scientist. One example is the term "model." Since these concepts and theories inform what questions are asked, it is important to establish a common understanding among the groups if they are to work together.

He suggested that the collaboration efforts should be bi-directional (between the computational and social sciences/humanities). Elements in this type of collaboration include formulating social science theories in model amenable forms, the identification of relevant social theories and ways to bridge theoretical gaps, the introduction of social complexity into computational models, and the identification of areas that require further social science theory and computational tools. The collaborative process also needs to

be intra-disciplinary in nature. Various social sciences need to be integrated as each discipline has contributions to make. The same should be said of the computational sciences (e.g., agent based simulation, information modeling, geographic information systems). The large challenge in this integration is incorporating the richness of the social sciences and humanities into the computational tools.

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**Modeling Motivation and Intent** - Ryan Hohimer, M&I Ontology Development Team, Pacific Northwest National Lab

Hohimer discussed a multi-year and multi-lab “motivation and intent” (M&I) research effort being conducted under the auspices of the Department of Homeland Security (DHS). The project is currently in its first year. The overall effort seeks to model the likelihood of individuals and groups turning to violence. Hohimer and his team are focused on bridging the language divide among computational modelers and social science experts, who may have different notions of concepts and terms. This effort aims to formalize in ontological language social scientific knowledge to make it useful to modelers. The M&I ontology seeks to provide definitions of terms, concepts, and logic used in each scientific domain’s theories by eliciting opinion from experts. Currently, the team is prioritizing what social science theories will be included in the ontology, but possible candidates include social movement theory, social identity theory, collective action theory, deviant legitimization theory, attribution theory, social cognition theory, and group dynamics theory. He asserts that this method of classification will help maintain the integrity of the scientific theories as the knowledge is transferred from the language of the scientist into a formal, standardized web language, thereby creating a shared language (lingua franca) between the modelers and the scientists. Hohimer highlighted the iterative nature of building an ontology which seeks to address fundamental knowledge transfer problems (how to formally capture what is in the experts’ heads and in the literature). In this vein, he maintains that validation efforts are essential.