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A World in Transformation: Challenges and Opportunities

Strategic Multilayer Assessment

6th Annual Conference

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This report represents the views and opinions of the workshop participants. The report does not represent official USG policy or position.

Contents

Executive Summary

The 6th Annual SMA Conference was held at Joint Base Andrews from 6-8 November 2012. The theme of the conference was *A World in Transformation: Challenges and Opportunities.* A significant portion of the conference addressed the needs of the Geographical Commands. Days One and Two were unclassified, while Day Three was held at the SECRET level.[1] As in previous years, representatives from the Geographical Commands were present throughout the conference. On Day Two and on Day Three, representatives discussed the Geographical Commands' pressing needs to provide the SMA community with an opportunity to mine its wide network of experts to assist in identifying capabilities that can match the Commands' needs. What resulted was a lively discussion, which is captured in this document.

The Joint Staff, J3, DDGO in partnership with OSD, have developed a proven methodology merging multi-agency expertise and information to address complex operational requirements that call for multi-disciplinary approaches utilizing skill sets not normally present within any one service/agency. The SMA process uses robust multi-agency collaboration leveraging intellectual/analytical rigor to examine factual/empirical evidence with the focus on synthesizing existing knowledge. The end product consists of actionable strategies and recommendations, which can then be used by planners to support COA Development. SMA is accepted and synchronized by Joint Staff, J3, DDGO and executed OSD/ASD (R&E)/RSD/RRTO.

Findings from Panel Discussions

Guest speaker Mr. Earl Wyatt, Rapid Fielding Office, Office of the Assistant Secretary of Defense for Research and Engineering spoke about the Rapid Fielding Directorate's (RFD) mission to identify, develop, demonstrate, assess, and rapidly field innovative concepts and technologies that supply critical capabilities to meet time-sensitive operational needs. The RFD strives to create a leaner, more agile force to increase effectiveness and maintain U.S. global leadership, which is capable of operating across domains. The RFD strives to deliver technical capabilities to U.S. forces and the speed of delivery needs to accelerate to win current and future fights.

Guest speaker Mr. Ben Riley, Rapid Fielding Office, Office of the Assistant Secretary of Defense for Research and Engineering, spoke about the relationship between RFD and SMA. Both offices are multidisciplinary, but the RFD is strictly anticipatory in terms of threats. Mr. Riley suggested future SMA projects consider identifying and examining emerging threats, enhancing human capabilities, and developing measures of effectiveness for social science.

Guest speaker Major General John Shanahan, J3 DDGO, presented the work that SMA completed in 2012. The South Asia stability project is of increasing importance given the drawdown of forces in Afghanistan, continued ethnic rivalries, and proliferation of tactical

[1] Please contact Meg Egan at Margaret.j.egan2.ctr@mail.mil for a copy of the classified report. The document is classified Secret.

nuclear weapons in the region. The cyber neurobiology project examined what effects cyberspace has on radicalization and mobilization and compared that to radicalization and mobilization in the physical realm. Maj Gen Shanahan noted that in order for these projects to add value to the warfighter, they must be operationalized.

Keynote speaker, LTG Michael Flynn, Director, DIA, spoke about the need to reorganize the DIA to meet current and future analytic requirements. He suggested reshaping analytic tradecraft as well as changing the culture of the agency to be more responsive to 21st Century requirements. These changes, dubbed Vision 2020, will include further integration of DIA into the operational community as well as organization changes to flatten hierarchies and increase effectiveness. These analytic and cultural changes are under way in order to more effectively and efficiently support the warfighter.

Panel One discussed the future nature of conflict. The panel found that while interstate war will not be obsolete in the future, as some have argued, conflict is likely to occur in nontraditional forms. Particularly worrisome is the diffusion of precision-strike weapons and cyber warfare capabilities by state and violent non-state actors (VNSA). Such capabilities are providing a wider set of actors the ability project force and create disruption at greater distances. Additionally, the future battle space might best be described by three terms: competent, concealed, and congested. The adversary will be competent, the weapons and targets will be concealed, and the terrain will be urban, congested areas.

Panel Two addressed how best to implement effective socio-cultural capabilities to meet the requirements of commanders, staffs, and policymakers at all levels of the Department of Defense (DoD). Social science contributions are often misunderstood by decision-makers. Social science is not a coherent set of disciplines. In fact, "science" implies laws and tested theories, which social science currently lacks. Social science models are not meant to predict, they are meant to inform. They provide the DoD with better questions, not better answers. If the DoD did not have social science, it would be much further behind in facing complex problems. However, further clarity of thought and method is necessary to help the DoD address complex challenges.

Invited speaker Dr. Robie Samanta Roy, Senate Armed Services Committee, spoke about the role of social science in war planning and the operational community. However, there are four key issues that must be addressed to ensure the effectiveness of this relationship, listed below.

- The gap between the research and user community must be bridged.
- Increase coordination within the research community is required.
- There is a need to ask the right questions to address pressing problems and accurately measure the effectiveness of social science solutions.
- Maintaining and encouraging the multidisciplinary nature of social science research is essential.

Shaping social science research in the DoD must happen now to prepare for the challenges of tomorrow.

Panel three explored the question, What can remote data collection of the Earth's environmental factors and population dynamics reduce the collection demands for assessing local, state, and regional stability? The panel found that remote data collection could be fused with social science models to inform trends and outcomes as long as the data used is good. Remote data collection has increasingly practical applications, including the development of the Famine Early Warning System Network (FEWS NET) that helps planners decide to intervene in a food crisis or not.

Panel Four addressed how defense social science basic research, and the MINERVA Research Initiative in particular, can address mission-relevant questions such as the motivation for violent extremism or the indicators of social conflict and stability. Basic research builds cultural and foreign area knowledge and creates insights to inform more effective strategic and operational policy decisions by war planners and warfighters. It leverages and focuses the resources of the nation's top universities toward fields of critical DoD interest. Finally, it fosters a community of subject matter experts in regions and social science topics of known interest—and what may be of future interest.

The Feedback from Command Panel asked representatives from the COCOMs, "What are the pressing needs in your commands?" Each COCOM is concerned with maintaining effectiveness in the increasingly resource constrained environment. Critical to this effectiveness is increasing collaboration with regional partners and other agencies and the development and utilization of Special operations forces (SOF).

Panel Five focused on how organizations outside the DoD confront complex problems in the information environment. The panel emphasized that while the USG has made great strides in adapting and employing new technologies, like social media, it must take further steps to collaborate and coordinate efforts across the whole of government. This will require a culture of collaboration—it cannot be a boutique effort within various agencies. The USG must continue to adapt and do business differently in the 21st Century.

LtGen Robert Schmidle, Deputy Commandant for Aviation, USMC, presented a talk on the psychological and social theories in radicalization and terrorist networks. Social theories make three major contributions to defense analysis: they 1) ground decision makers in context, 2) help analysts understand why individuals radicalize, and 3) combine with technology and physical sciences to increase understanding of complex issues.

Panel 6, Insights from Neurobiology on Influence and Extremism, focused on presenting multi-disciplinary cutting-edge research insights for the operational community. Use of neuroscience and neurotechnologies can help create a full picture of the brain and its activities. Of particular interest to the planning community is the role of aggression in terrorist activities. Further research on the interaction of brain structure, function, genetics, and social, individual, economic, and environmental factors is needed to fully inform

aggression. U.S. warfighters must consider neurobiology in operations planning and execution.

Panel Seven discussed how new insights from both neuroscience and network sciences are likely to change the way the military conducts operations, to include influence operations, intelligence analysis, psychological and military information support operations, and cyber activities. Cyber space is becoming increasingly complex and is expanding at an incredible rate. Information technology has become so pervasive that some suggest the first indicators of conflict would come from cyber/social media. Another way the information environment is changing Information Operations (IO) is that it is now a two-way street; and operators need to be prepared to respond to messages in near real time. The issue of online attribution is important. In the physical realm, one must declare one's allegiance. In the online realm, one's identity is fungible. Science has advanced to the point where it can help inform when to disclose online identity and when not to. However, this area deserved a tremendous amount of further study.

Panel Eight members agreed on the need to dive deep into the operational environment to anticipate future threats and increase the agility of U.S. forces. However, changes in the Intelligence Community (IC), culture shifts in existing institutions, and development of intelligence fusion centers are necessary for effective planning and implantation of this analysis. Understanding how economic, social, and political issues will coalesce over time will allow for better planning and even anticipation of events. It is necessary that futures analysis makes connections across disciplines in order to arrive at conclusions that are valuable for futures planning.

Workshop Introduction

SMA Overview, Dr. Hriar Cabayan, OSD/SMA

Dr. Hriar Cabayan is a Lawrence Livermore National Laboratory (LLNL) employee working for the Department of Defense under an Intergovernmental Personnel Agreement (IPA). He currently works out of LLNL's National Security Office. He is assigned to support the Office of the Secretary of Defense/Director, Defense Research and Engineering (OSD/DDRE). His primary responsibility is to manage a joint OSD/US Strategic Command effort to provide long term planning support to the Commands. The effort is accepted and facilitated by the Joint Staff (J-3).

Dr. Hriar Cabayan, OSD/SMA, described the Strategic Multi-layer Assessment (SMA) program. The SMA office provides planning support to Combatant Commands (COCOMs) with complex operational imperatives requiring multi-agency, multi-disciplinary solutions that are not within core Service/Agency competency. The SMA office has developed a proven methodology merging multi-agency expertise and information to address complex operational requirements that call for multi-disciplinary approaches utilizing skill sets not normally present within any one service/agency. The SMA process uses robust multi-agency collaboration leveraging intellectual/analytical rigor to examine factual/empirical evidence with the focus on synthesizing existing knowledge. The end product consists of actionable strategies and recommendations, which can then be used by planners to support COA Development. SMA is accepted and synchronized by Joint Staff, J3, DDGO and executed OSD/ASD (R&E)/RSD/RRTO.

Fiscal year 2013 planned projects include a South Asia sub-regional risk assessment effort including short and long-term decline requested by CENTCOM, PACOM, and STRATCOM and a megacity intelligence, surveillance, and reconnaissance (ISR) project, requested by PACOM.

Mr. Earl Wyatt, OSD, ASD R&E/RFD

Mr. Wyatt is the Deputy Assistant Secretary of Defense, Rapid Fielding in the office of the Assistant Secretary of Defense for Research & Engineering. Mr. Wyatt is responsible for policy and oversight of fielding capabilities that counter unconventional and time-sensitive threats. He facilitates rapid technology transition within the Department through discovery and demonstration of advanced technology concepts and works with interagency and coalition partners, industry, and academia to facilitate the timely satisfaction of validated priority operational needs.

Mr. Wyatt presented a briefing on the rapid fielding directorate's (RFD) mission and framework for response to emerging threats. The RFD's mission is to identify, develop, demonstrate, assess, and rapidly field innovative concepts and technologies that supply critical capabilities to meet time-sensitive operational needs. The RFD is focused on

developing responsive and anticipatory processes with better buying power to ensure the effectiveness of the COCOM operations.

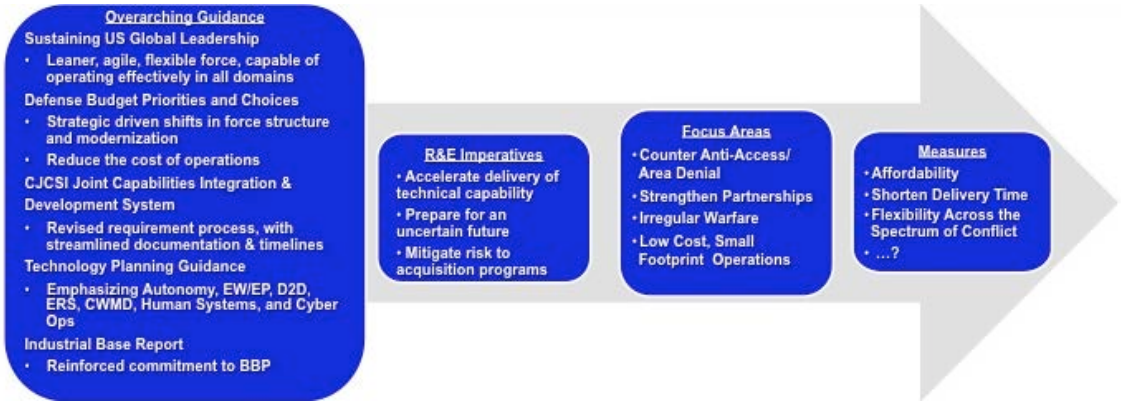

Figure 1: Adaptive Capability Development Model

In looking ahead RFD is working toward the development of an adaptive capability development model, shown in Figure 1, to develop effective responses for emerging threats. This model is capable of scaling up or down to address a wide range of divergent threats and mission areas. This model supports the Secretary's goal of establishing a leaner, more agile force to effectively operate across all domains, while remaining conscious of decreasing defense budgets. RFD will look to assist in addressing shortfalls identified in the Chairman's assessment and COCOM integrated priorities. This will be done through increased emphasis in emerging tactical capabilities and a renewed emphasis on disruptive threats, red teaming concepts, and adapting to commercially focused technology for military applications. RFD will continue to support ASD R&E imperatives accelerating the delivery of technical capability, preparing for an uncertain future, and mitigating risk to acquisition programs.

RFD is currently focusing on four different strategic priority topics to ensure responsiveness to current and emerging needs. The first priority is ensuring the ability to project power in areas in which access and freedom to operate are challenged. Second, RFD is defending U.S. territory from direct attack by state and non-state actors. Third, RFD is attempting to disrupt, dismantle, and defeat designated terrorist organizations and their affiliates. Finally, RFD is building partnership security capacity with nations whose interests and viewpoints are merging into a common vision of freedom, stability, and prosperity. It is imperative that the delivery of these technical capabilities is accelerated to win the current fight.

Questions for future RFD consideration include the following.

- How do we best anticipate and disrupt the triggers of violent actions?

- How do we prepare for the unintended consequences that may result from U.S. engagement?
- How do we communicate U.S. intentions and foster trust in a country with decentralized government?
- How can SMA investments diffuse the need for kinetic engagement?
    - How do we measure success of SMA type efforts?
- How do we best strengthen and measure the benefits of partner capacity?

Mr. Ben Riley, OSD, ASD R&E/RFD

Mr. Riley is the Principal Deputy, Deputy Assistant Secretary of Defense, Rapid Fielding in the office of the Assistant Secretary of Defense, Research and Engineering. Mr. Riley is responsible for policy and oversight of fielding capabilities that counter unconventional and time-sensitive threats. He facilitates rapid technology transition within the Department through discovery and demonstration of advanced technology concepts and works with interagency and coalition partners, industry, and academia to facilitate the timely satisfaction of validated priority operational needs.

Mr. Riley spoke about the relationship between SMA and RFD. The two offices are closely related and conduct short-term projects; however, RFD projects are anticipatory. Threats that each office address are complex and need multiple perspectives to understand the problem. This is addressed through the multilayer emphasis in SMA, which implies many different sources and disciplines involved in every project.

There have been many SMA productions over the past six years. Each one has been interesting and has added value to the community as a whole primarily due to SMA's network of experts, diversity of views, and disciples that are involved.

SMA work focuses on four key areas.

- What are emerging threats and how can they be identified?
- What are boundaries between law enforcement and military?
- How is effectiveness measured and how can SMA contribute to this?
- How can human capabilities be enhanced?

Maj. Gen. John Shanahan, JS, DDGO

Maj. Gen. John N.T. "Jack" Shanahan is Deputy Director for Global Operations, Operations Directorate, Joint Staff, the Pentagon, Washington, D.C. He is responsible to the Director for Operations and the Chairman of the Joint Chiefs of Staff for oversight and coordination of worldwide operational matters. This includes global reconnaissance operations, cyberspace operations, Military Information Support Operations, Information Operations, and Special Programs.

Maj. Gen. Shanahan spoke about the status of SMA and the work completed in 2012. Last year, the SMA program transitioned from STRATCOM to the Joint Staff J3. The J3 is able to provide oversight and advocate for SMA. SMA can take on two projects a year, as requested

by the COCOMs. In order to add the most value, and due to financial constraints, projects that cut across multiple COCOMs are prioritized.

The 2012 projects were the South Asia Stability project and the Cyber Neuroscience project. The South Asia study will continue into 2013. Given the drawdown of forces, the continued ethnic rivalries, and the alarming proliferation of tactical nuclear weapons, the problem set is of increasing concern. The Cyber Neurobiology project's original question was, "What impact does cyberspace have on events such as the Arab Spring?" This morphed into what effects cyberspace has on radicalization and mobilization and how this is different from the physical realm. In both of these projects, the key finding was that the USG needs to stay left of bang in order to most efficiently achieve its objectives.

SMA work needs to be operationalized to add value to the warfighter. The South Asia Stability Project will be used in the field by the J5. Military Intelligence and Special Operations staff in PACOM and CENTCOM will use the Cyber Neuroscience project.

The 2013 Megacity project will research socio-cultural analysis methods and novel remote sensing techniques for collecting indicator variables of resilience and vulnerability within interrelated megacity and rural socio-cultural systems. This cutting edge research will help the USG focus its phase zero efforts. Over the next 10 years, the largest, most pressing challenges will be seen.

Reshaping Defense Analysis, LTG Michael Flynn, DIA

Lieutenant General Michael T. Flynn graduated from the University of Rhode Island in 1981 and was commissioned a second lieutenant in Military Intelligence. His first assignment was as a paratrooper of the 82nd Airborne Division at Fort Bragg, North Carolina. Since that time he has served in a variety of command and staff positions to include, Commander, 313th Military Intelligence Battalion and G2, 82nd Airborne Division; G2, 18th Airborne Corps, CJ2, CJTF-180 Operation Enduring Freedom (OEF) in Afghanistan; Commander, 111th Military Intelligence Brigade at the Army's Intelligence Center at Fort Huachuca, Arizona; Director of Intelligence, Joint Special Operations Command with duty in OEF and Operation Iraqi Freedom (OIF); Director of Intelligence, United States Central Command with duty in OEF and OIF; Director of Intelligence, the Joint Staff; Director of Intelligence, International Security Assistance Force-Afghanistan and US Forces-Afghanistan, Special Assistant to the Deputy Chief of Staff, G-2, and Assistant Director of National Intelligence, Partner Engagement. LTG Flynn became the 18th Director of the Defense Intelligence Agency on 24 July 2012.

LTG Michael Flynn, DIA, spoke about reshaping defense analysis for the 21st century. Defense analysis used to focus solely on the physical environment; however now, there is an ever-growing focus on the virtual environment. Furthermore, the operational and strategic environments are becoming more complex and less predictable. DIA analysis needs to

Figure 2 DIA Vision 2020

change to meet these new challenges. These challenges include new potential threats from cyber criminals, hackers, and the increasing fragility of North African and Middle East states.

The transformation of DIA will include changes to analytics and the culture of the agency. Making changes now will lead to greater flexibility, through increasing the range of options at less cost, for policy makers and military leaders in the future. Analytic changes will include continual investment in professional development and training of analysts. The cultural changes will take more time and will require that analysts buy into the new culture. DIA's view of the future has been dubbed Vision 2020 (Figure 2), and the first phase is underway currently. This effort is examining integration in the operational community, organizational structure, and workforce health areas. Vision 2020 is an effort to identify areas where change can occur to make DIA a flat and effective organization. Vision 2020 is striving for a DIA that is outwardly and operationally focused. This will be completed by 2013.

The DIA will continue to support warfighter planning and capabilities through foundational analysis. This analysis includes order of battle, infrastructure, and strategic warning. Furthermore, foundational analysis permits in-depth understanding of foreign weapons systems and it is crucial in support of weapons development and acquisition.

U.S. security requires a holistic, comprehensive understanding of operating environments, which will be gained through development of one directorate that has several regional expertise centers, while maintaining a global focus of analysis. These centers will focus on integration between analysts and collectors in addition to having specialized and integrated collection and operational platforms. All of these centers will include collection, analysis, and technology capabilities well as mission services support such as communications and logistics. It is necessary that the centers communicate and the number of centers remains small to maximize efficiency. This work will connect COCOMs with J2 intelligence analysis and Joint Operations.

The training and work of analysts is important and greater attention needs to be paid to it. The way in which analysts think about the world influences their analysis, and this must be remembered when conducting analysis. Analysts have to be prompt and efficient in their analysis, but this is made more difficult given the volume of data crossing their desks. Currently, analysts are unable to effectively process, exploit, and visualize the significance of

data collected in an operationally significant amount of time. An emphasis on making connections between different data points to create a full picture, including integrating high and low source material, needs to be made, which will require development of new innovative methods of structuring queries.

The DIA has a role to play in socio-cultural tradecraft, in particular, integrating new concepts, defining new standards, and creating hubs of expertise through Vision 2020. Through these changes, analysts will be able to spend more time understanding grassroots phenomena and continue to expand methodologies. This will be especially useful as the operational environment continues to change: the power of classic nation states is declining while populations are exploding, particularly in Sub-Saharan Africa. Social structure and demographics are shifting and institutions in the IC need to be able to respond to them.

Another challenge is that current war doctrine progresses from peace to war but rarely focuses on the war to peace transition. The DIA will focus on these drawdowns. In order to decrease conflict costs, investments need to be made in the prewar process to further understand "left of the boom." Better understanding the socio-cultural environment is important to give decision makers sufficient levers to stay in the prewar and postwar environments. Greater investments need to be made that will allow the DIA staff to accurate reflect and be adaptive to the new demands of the 21st Century.

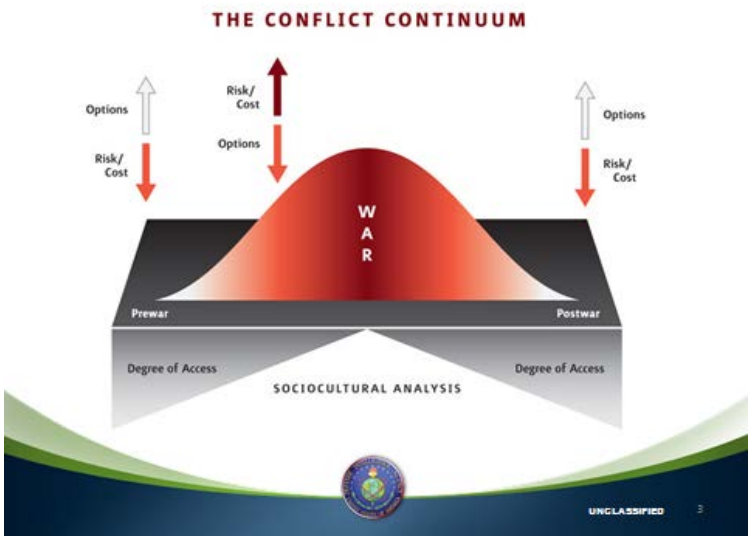

Figure 3 Conflict Continuum

Discussion

Does DIA have a role in integrating information, rather than assessing it? If you have a system, of governments or terrorists, who are pan-communists or pan-Arabists, with a social media network, would not the solution be to inject information into the system, as in Radio Free Europe? Is DIA involved in injecting information into the pan-Arabist movement who are not freedom loving?

For any problem, there is a "what" and "so what." The question DIA must ask is, "are we enabling capability to understanding what is going on?" In our countries of operation, there are strong military partnerships, which help inform what is occurring on the ground. The

analysis of data collected on the ground shapes the worldview of the DIA. In order to have an accurate worldview, the agency must integrate as much information as possible, including open source information. In any situation, it is easy to go in and take action, what is difficult is making sure the information the decision is based on is correct. This is what the DIA is striving to do.

Virtual reality demands a contextual understanding of the foreign world, which involves languages. What language tools are you developing to enhance understanding?

One option to increase the language skills of DIA employees is to set quotas; for example, 90 percent of new hires must speak a language—any language. Alternatively, the DIA could prioritize 10 to 15 languages and hire individuals that speak them. One of the reasons that language analysis is difficult is because of the cost associated with training and sustaining someone who does not already speak a language. However, if hiring and recruiting practices are changed, the opportunity to increase language skills in DIA is immense.

In regards to vision 2020, is that report going to be available to agencies and will they be able to have, and assist in, this vision? What is the release date?

The report will be made available to the agencies. Congress has been notified that DIA will be making these changes and about the motivation behind them. A white paper will be ready by mid-December for distribution in January. In order to make financial decisions, a plan will be set by the end of the fourth quarter. The priority of the Vision 2020 is to change the culture of the DIA.

There is no common understanding or agreement across the community about what skill sets analysts should have. If you are going to reshape analysis and professional development, what is the common set of standards?

The skills necessary are listed but they need to be adhered to. There needs to be a discussion about this current set of standards and decide what needs to be added or subtracted. A board of experts needs to be brought together to figure out what the priorities across the IC are. It is essential that analysts have the tools and training necessary to get at issues left of the boom.

Panel One: Future of Conflict

This panel discussed how the character of conflict might evolve in the future as a result of two factors:

1. Ongoing changes to the strategic security environment, and
2. The global development of new warfighting strategies and capabilities.

The panel debated and sought to identify key aspects of future conflict that US defense planners and warfighters should consider in developing capabilities and investment strategies for the future. Questions for this panel to address included:

- Will the post-Cold War decline in international armed conflict continue, leaving intrastate, societal-based conflicts as the primary security concern for the future?
- Will the ongoing diffusion of power, the proliferation of technologies - including nuclear - and unsettled territorial claims involving major military powers usher in a new era of increasing risk of interstate conflicts?
- Will the future see a mixture of both intrastate and interstate warfare, further complicating US defense planning?
- How are other countries envisioning future war, and what can we learn from the warfighting strategies and capabilities currently being developed by non-US military and planning organizations?

Panelists

- Mr. Dan Flynn, DNI/NIC (moderator)
- Mr. Elbridge Colby, CNA
- Dr. Jacqueline Deal, Long Term Strategy Group
- Dr. David Johnson, Army Strategic Studies Group
- Dr. Thomas Mahnken, JHU/SAIS

Mr. Dan Flynn, DNI/NIC

Mr. Dan Flynn is the Director of the Global Security Program for the National Intelligence Council's Strategic Futures Group. In this position, he is responsible for leading national-level, interagency projects to provide senior U.S. policymakers, defense officials, and warfighters assessments of long-term and crosscutting military-security issues of strategic importance to U.S. security interests. In this capacity, he is also responsible for leading the National Intelligence Council's strategic analytic gaming efforts to assess emerging national security issues. He has worked closely with the Office of the Secretary of Defense, the Joint Staff, and the COCOMs in support of U.S. military strategy development and planning efforts. He has also served as an advisor to several Defense Science Board studies.

Many indicators suggest that the numbers of conflicts, especially interstate conflicts, have declined over the last two decades. In addition, where conflicts remain, the number of battlefield fatalities has decreased. Scholars account for these trends in several ways including the spread of democracy, the maturing age structures within many industrialized states, the economic interdependence of major powers, the lack of territorial ambitions and force projection capabilities of many states, nuclear deterrence, and the role of the United States and its allies as global security providers in the post-Cold War environment.

These trends, along with the absence of a direct-armed conflict between the great powers since World War II, have led some Western scholars to speculate whether interstate warfare itself is becoming obsolete. The cost of war is no longer worth the benefit to state leaders.

There are, however, counter indicators to the more optimistic picture that some scholars have painted in reporting on the decline of conflict. For example, although the number of conflicts has decreased in the immediate aftermath of the Cold War, the International Peace Research Institute in Oslo reports that the number of countries involved in those conflicts has increased. In addition, the 2012 *Peace and Conflict* report from the University of Maryland indicates that after an initial sharp drop in active conflicts in the first five years after the Cold War, the number of worldwide conflicts has leveled off and is no longer declining. In addition, if the definition of conflict is expanded to consider all militarized disputes between pairs of states, including the display as well as the uses of military force, then such disputes have actually increased during this period.[2] Similarly, if we look at the total cost of war on a society, not just battlefield deaths, we will find the deadliest interstate conflict since World War II occurred in the post-Cold War period. The Second Congo War (also known as the Great War of Africa) directly involved eight African nations, as well as about 25 armed groups and led to the deaths of an estimated 5.4 million people, mostly from disease and starvation, making it the most deadly conflict worldwide since World War II.

In the future, greater accessibility to instruments of war, including precision-strike and cyber warfare capabilities, is expected Such capabilities are providing a wider set of states the ability to project force and create disruption at greater distances. Such developments suggest that the extent of societal and military disruption rather than battlefield fatalities might be a more meaningful metric for determining the impact of future conflicts.

The question, "What is the future of conflict?" remains meaningful today. This panel specifically will address how the character of conflict might evolve in the future as a result of two factors:

1. Ongoing changes to the strategic security environment, and
2. The global development of new warfighting strategies and capabilities.

Dr. Jacqueline Deal, Long Term Strategy Group

Dr. Jacqueline N. Deal is President and Chief Executive Officer of the Long Term Strategy Group (LTSG), a Washington, DC-based defense research firm founded in 2006. For most of the last decade, she has supported the Office of the Secretary of Defense, the National Intelligence Council, and other U.S. government and military sponsors on projects related to Chinese defense modernization and international relations in East, South, and West Asia. Recent studies and briefings that she has authored or co-authored have analyzed China's approach to the information technology "revolution in military affairs" (RMA); the military balance

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[2] *The Frequency of Wars*, Mark Harrison, Department of Economics and CAGE, University of Warwick Centre for Russian and East European Studies, University of Birmingham Hoover Institution, Stanford University; Nikolaus Wolf, Wirtschaftswissenschaftliche Fakultät, Humboldt-Universität Centre for Economic Policy Research

between China and India; future conflict scenarios in the South China Sea and Indian Ocean regions; China-Iran relations; military nationalism within the Chinese People's Liberation Army; and China's capacity for generating radical technological innovations.

Dr. Deal spoke about objective trends in the security environment that have provoked some to argue that interstate war is obsolete.

The "Long Peace"

The absence of major power war since the Korean War is striking. For the last decade, the United States has been preoccupied with problems related to intra-state war, civil conflict, counterinsurgency, and counterterrorism operations. Many have argued that the era of major power war has passed.

Proponents of this view point to the rise of economic interdependence. Despite the fact that the last era of unprecedented globalization, right before World War I, famously ended in a major conflict involving great powers (disproving the thesis of Norman Angell[3]), many believe that this time is different. Commerce has changed the incentives of states, encouraging them to favor peacetime economic interactions over military competition and conflict.

Another common argument is that major power war has become unthinkable because norms have changed. Cosmopolitanism has replaced nationalism as the dominant set of ideas in the minds of world leaders. "Davos man" is real, and would not fight a fellow Davos man or woman.

An additional argument in favor on the long peace is that the United States plays the role of global security provider. No other country has the strength or the motivation to challenge this state of affairs.

Finally, it is also argued that the spread of nuclear weapons will keep major powers from fighting one another. With nuclear escalation a possibility, the stakes are just too high.

China

It is interesting to consider how China perceives these trends. It is important to recognize that Beijing's perspective on all of these issues is strikingly different from Washington's—almost the opposite.

The (Too?) "Long Peace"

[3] Sir Norman Angell's book, *The Great Illusion*, argues that economically intertwined countries are less likely to go to war.

For China the absence of major power war over the last several decades has been useful, a critical part of the global conditions that have enabled the country's economic rise. However, today, China may also be a victim of the absence of war insofar as conflict has a way of clarifying power relations, and to date, China's status has not risen nearly as fast as its economic and military influence. From Beijing's perspective, smaller countries like the Philippines, Vietnam, and even Japan should now be deferring to China's position on territorial and resource disputes, given the power disparity. But that is not happening. For China then, the absence of major interstate war does not signal its obsolescence. Instead, from Beijing's point of view, the long period of peace has given rise to new power dynamics that could render war necessary in the future – if countries fail to recognize these new dynamics and act accordingly.

For China, economics and conflict are not two separate domains as they are in the West. Chinese elites do not share the American view of economic interactions as essentially non-zero sum, and China's approach to global trade is more neo-mercantilist than market-based. Beijing clearly does not trust markets to deliver essential goods, such as energy resources. That is why China is willing to overpay to lock up oil supplies on a long-term basis. That is also why China does not trust the United States to police China's sea lines of communications and is therefore building up its own capabilities to project power.

With regard to the spread of anti-war norms, this trend may have limited application outside the West. While China certainly sends delegates to Davos, Chinese elites remain nationalists, rather than cosmopolitans. Today's Chinese Communist Party leaders identify their task as restoring China to the position of greatness that it held before the so-called "century of humiliation" inflicted by imperialist powers.

In fact, Chinese elites believe that the entire international system of laws and norms that currently exists is a tool used by the West, and particularly the United States, to suppress China. Accordingly, China is far from comfortable with the United States playing the role of global security provider. Party leaders in Beijing believe that the United States is bent on ending the Chinese Communist Party's (CCP) rule in China; the oft-heard phrase is that Americans are guilty of trying to "Westernize and divide" China.

Mao Zedong famously called the atomic bomb a "Paper Tiger," and while there are many uncertainties surrounding the size of the Chinese nuclear arsenal, one interpretation of China's choice to maintain a "minimal" or even now a "limited" deterrent is consistent with Mao's logic: Perhaps Chinese elites believe that it is possible to neutralize a potential opponent's nuclear force with only a minimally sized or limited arsenal because the opponent will not be willing to risk any kind of nuclear escalation and will therefore abstain from using nuclear weapons against a nuclear-armed China. If that is the case, the most important level of competition is conventional. It is in the conventional domain that China has made astonishing progress in the last decade, from an impressive and expanding arsenal of precision-guided ballistic and cruise missiles to anti-satellite and cyber capabilities. Not to mention China's increasing surface navy, boasting vessels that can

operate hundreds of miles from Chinese coasts. China has now achieved the ability to target U.S. and allied airfields, ports, and communications facilities in the Western Pacific.

Conclusion: Questions for the United States

Up to now, Beijing has pursued the Deng Xiaoping-vintage strategy of "biding time" and downplaying Chinese capabilities. However, this appears to be changing. Given China's very different attitude toward trends relevant to interstate war, including its usefulness, how should the United States think about trying to 1) deter Chinese aggression, and 2) reassure allies, partners, and friends in the Asia-Pacific region? Given China's "anti-access, area denial" force of ballistic and cruise missiles, and its capable air force, it is unlikely that U.S. submarines will be sufficient. The Air-Sea Battle concept has been discussed, but seems to involve strikes on the Chinese mainland, so complementary concepts with lower escalation risks would be helpful. To maintain deterrence and reassure other states, it is worth considering developing the anti-access capabilities of U.S. allies, partners, and friends in the region, taking advantage of the land on islands and archipelagos in the East and South China Seas to position mobile concealable missile batteries there. This would complicate China's target set and put China in the position that the United States currently finds itself in – i.e., looking for difficult to find weapons. Similarly, it makes sense to consider improving regional ground-based coastal defenses, and possibly developing mobile air forces that can stage out of temporary "places" rather than fixed and vulnerable "bases." These are just a few of many possible ideas that could be developed further to maintain stability in the region in the face of China's build-up and alternative perspective on major power war.

Dr. Thomas Mahnken, JHU/SAIS

Thomas G. Mahnken is currently Jerome E. Levy Chair of Economic Geography and National Security at the U.S. Naval War College and a Visiting Scholar at the Philip Merrill Center for Strategic Studies at The Johns Hopkins University's Paul H. Nitze School of Advanced International Studies (JHU/SAIS). Dr. Mahnken served as the Deputy Assistant Secretary of Defense for Policy Planning from 2006-2009. In that capacity, he was responsible for the Department's major strategic planning functions, including the preparation of guidance for war plans and the development of the defense planning scenarios. He was the primary author of the 2008 National Defense Strategy and contributing author of the 2006 Quadrennial Defense Review. He spearheaded the Secretary of Defense's Minerva Research Initiative, which will provide $100 million in grants to universities to conduct basic research in the social sciences, and led an interagency effort to establish, for the first time in five decades, a National Security Council-run interagency policy planning body.

Dr. Mahnken spoke about changes in the means of warfare and how these changes affect the security environment. What we see now is the most recent iteration of a historical pattern of the growth and diffusion of innovations. Historically, military innovations have yielded an

initial advantage until others copied and countered those innovations. Then, a new equilibrium is born.

This dynamic can be seen with regard to precision weaponry. The U.S. enjoyed an absolute advantage in precision weaponry as showcased by the 1991 Gulf War. Then the U.S. took an early lead in GPS coordinated weapons. However, now the U.S. is losing the broad, absolute advantage it has held for decades. China has become a leading actor in precision strike. This development will drive the security environment in Asia.

Precision strike refers not just to munitions, but ISR, command and control (C2), and coordination. The Chinese have focused on precision-guided ballistic missiles in particular. Additionally, precision weaponry is being used in other forms such as artillery, mortar rounds, and other shorter-range systems. Therefore, a larger number of countries can adopt the technology because it is easier and cheaper to do so.

There is a proliferation of short-range precision weaponry currently. This has put a greater number of targets at risk and creates new vulnerabilities between adversaries. Adversaries are making more forces mobile and concealing them. There is great interest in striking C2 linkages. This competition is going to continue and lead to a situation where some targets will be unproductive to strike. However, some targets cannot be concealed and will remain vulnerable like civilian infrastructure. Denial of territory is becoming easier than controlling territory. Invasion will be much more difficult and costly. In addition, because invasion will become more difficult, wars will focus on coercion and limited political objectives.

This has a number of peacetime implications. First, the spread of precision strike and the ability to exclude others from one's area is a concern that could erode international norms such as freedom of navigation. To prevent this, actors could use international norms to limit the growth of precision strike weapons.

Mr. Elbridge Colby, CNA

Elbridge Colby is a principal analyst and division lead for global strategic affairs at CNA, where he focuses on strategic, deterrence, nuclear weapons, and related issues and advises a number of U.S. Government entities. Previously, he served as policy advisor to the Secretary of Defense's Representative for the new Strategic Arms Reduction Treaty, as an expert advisor to the Congressional Strategic Posture Commission, as a staff member on the President's Commission on the Intelligence Capabilities of the U.S. Regarding WMD, with the Coalition Provisional Authority in Baghdad, Iraq, and with the State Department. Mr. Colby has also been an adjunct staff member with the RAND Corporation and has served as a consultant to a number of U.S. Government bodies. He publishes regularly on defense and foreign policy issues in a variety of venues such as The National Interest, ForeignPolicy.com, Policy Review, and Orbis, and has published or is slated to publish book chapters in a number of edited collections. He has also appeared on radio and spoken to government, expert, university, and broader public audiences in the United States, Europe, and Asia, and is a regular participant in Track II discussions, particularly in Asia. He is a recipient of the Exceptional Public Service Award from the Office of the Secretary of Defense and of the Superior and Meritorious Honor Awards from

the Department of State. A term member of the Council on Foreign Relations, a member of the International Institute of Strategic Studies, and co-chairman of the Washington, D.C. Advisory Committee of the Hamilton Society, Mr. Colby is a graduate of Harvard College and Yale Law School.

Mr. Colby addressed the role of nuclear weapons in the future security environment. First, however, he wanted to address the question of whether conflict, especially major conflict, will remain a concern in coming decades. The answer is yes, but not an unqualified yes. Not only will conflict remain possible, but major conflict will remain possible as well. This has a major impact on the salience of nuclear weapons in the future security environment.

The question of the possibility of major conflict is important because there are quite a few people, including some very thoughtful people, who contend that a number of factors are combining to make major war "unthinkable." They say that the increasing interconnectedness of the global economy, the changes in global attitudes towards war, the evident destructiveness of major conflict, and the spread of liberal democracy combine to preclude major war.

It is important to acknowledge that there is a lot to this argument. War and violence in general are both less frequent and less likely in the advanced parts of the world than they were 300, 200, or even 100 years ago. However, that does not mean that war is unthinkable or impossible.

First, the international system is still fundamentally lawless. Benevolent stability among nations, where it exists, is usually enforced and backed by U.S. power, which is, after all, a contingent rather than a necessary feature of the international scene. Nations, therefore, need to think about safety in ways that include the possibility of war. Witness to this point is the persistence of war planning in most of the world's military establishments.

Second, the world market is not perfect and while economic interconnectedness is proceeding apace, there are still very important interests to be gained or lost through war. For example, look at the U.S. and other nations' efforts to protect the free flow of oil or standoffs over economic exclusion zones in East and Southeast Asia. Moreover, the international economic order is in trouble, hardly supporting the hopes of those who argue that since everyone can get rich readily there is no need to fight.

Third, it is true that cultural morals have turned against war in some parts of the world, like Western Europe, but they have not in others. In most of the rest of the world, war remains an acceptable, if not a desirable, option. Indeed, in the U.S. war is a more acceptable option today than it was 100 years ago. Broadly speaking, there is no way to know if Europe is the vanguard of the world in its pacifism or the exception. It could be that Europeans are just exhausted of fighting.

Fourth, democracy has indeed spread but it is not certain that democracies will never fight. It has been noted that maturing democracies tend to be some of the most bellicose regimes and, while it seems justified to say that liberal democracies are more likely to find ways to compromise with one another, it also is true that democratization does not solve the basic problem of competing and often zero-sum interests. The greatest war in American history, the Civil War, was fought between two democracies, after all.

All that said, although war is still possible, it is less likely than it was in the past. In large part because of the shadow of nuclear weapons. This has made total war among the major powers indisputably and obviously so catastrophically dangerous that it has made them much more cautious about going to war or even getting near it. This role is going to persist in the future security environment. Nations will continue to see the threat of awesome devastation as the surest guarantor of their security, whether held in their own hands or, as in the case of U.S. allies, in the basically trusted hands of a big brother ally.

It is important to note here, however, that the caution-inducing function of nuclear weapons is not static or immutable. It is a product of capability, will, and credibility and of the relative valuation of interests and the willingness to bear losses. So nuclear deterrence is not necessarily easy and can be quite hard in some circumstances. However, it is significant and often determinative. This role can be played in the foreground or in the background. In the Cold War, nuclear weapons were front and center because of the intensity of the political rivalry between the Blocs and because of the West's need to rely on nuclear forces to compensate for Soviet theater advantages in Europe. After the Cold War, on the other hand, U.S. military and geo-economic advantages and the absence of a credible competitor pushed nuclear weapons to the background.

How salient will nuclear weapons be in the future? It is difficult to answer this question but it is likely that nuclear weapons will play a more salient role in warfare particularly because there will be more regional powers with nuclear weapons and the non-nuclear military balance will even out, or at least become less lopsidedly in the U.S.'s favor. Given this, the U.S. is going to have to think more seriously again about how to limit escalation and limit war in ways that have been largely lost from the intellectual conversation in defense circles over the last two decades of undisputed conventional dominance.

Dr. David Johnson, Army Strategic Studies Group

Dr. Dave Johnson is the Director, Chief of Staff of the Army Strategic Studies Group (SSG). Prior to joining the SSG, Dr. Johnson was a senior researcher at the RAND Corporation where he focused on military innovation, joint operations, and strategy for 14 years. Before joining RAND, Dr. Johnson had a twenty-four year career in the U.S. Army, serving in command and staff positions in the Infantry, Quartermaster Corps, and Field Artillery branches in the mainland United States, Hawaii, Korea, Germany, and Belgium. He retired as a Colonel in 1997. Dr. Johnson has MA and Ph.D. degrees in history from Duke University. He also has an MMAS from the U.S. Command and General Staff College, an MS from the Industrial College of the Armed Forces, and a BA from Trinity University. He is the author of numerous books,

articles, and reports including Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945; Learning Large Lessons: The Evolving Roles of Ground Power and Air Power in the Post–Cold War Era; and Hard Fighting: Israel in Lebanon and Gaza. Dr. Johnson's work has been on the professional reading lists of the U.S. Army Chief of Staff, the U.S. Air Force Chief of Staff, the U.S. Army Training and Doctrine Command Commander, the Chief of the Air Staff Royal Air Force (United Kingdom); and the Royal Australian Air Force Chief of Air Staff.

Dr. Johnson spoke about irregular warfare. He argued that the future security environment could best be understood with three terms: competent, concealed, and congested. The adversary will be competent, the weapons and targets will be concealed, and the terrain will be urban, congested areas.

Israel's Second Lebanon War exemplified this kind of environment. The Israelis thought that the threat was a low-grade asymmetric one, but Hezbollah became a major adversary because its precision weaponry was concealed. This forced the Israeli Army to have to fight to get close to the adversary. The war was not a defeat for Israel, but the absence of victory was very problematic as the Israeli Defense Force (IDF) looked weak for the first time. Israel is now focused on learning how to fight in congested terrain against concealed weapons.

Competent, concealed, and congested will likely become a mode of warfare for adversaries that want to play to U.S. weaknesses. These groups are not insurgencies; you cannot win them over. They have a different agenda and many military aged males.

Paying attention to Hezbollah is important because although it is deeply linked to Israel and the Palestinian question, they do provide insights into a category of potential adversaries that the United States could encounter in the future. These types of actors may emerge from the ongoing turmoil in North Africa and the Middle East (or elsewhere such as North Korea). Their strategy relies on protraction, fighting "amongst the people," causing large numbers of casualties, influencing the media, and reluctance of western states to put "boots on the ground." It may become the form of warfare for adversaries who confront the "Western Way of War." They are not necessarily "insurgencies," but irregular warfare COIN and "stability operations" may be largely irrelevant.

Future U.S. capabilities should be linked to potential adversary capabilities across the full range of military operations. U.S. Joint Forces, particularly the Army, has focused increasingly on irregular adversaries since 2001—as had the Israelis had before 2006. U.S. joint forces focused on major combat operations before OIF, but how much the institution remembers is an important question. The United States has not confronted hybrid adversaries since the Vietnam War: high intensity combat challenges that require joint, combined arms fire and maneuver.

Dr. Johnson presented some final thoughts for a joint force for the future. First, potential adversaries know U.S. capabilities—and vulnerabilities—and are adapting. Therefore, future challenges require joint forces. Joint forces should be prepared for a range of adversaries: irregular, hybrid-irregular, state-sponsored, and state. They should be prepared for operations in complex terrain, particularly large urban areas with the adversary operating "amongst the people." The force should be capable of joint, combined arms, fire and maneuver. A balanced ground force will be key; armor (tanks/IFVs/APCs) matters against adversaries with standoff fires. Finally, scale matters: it takes troops to control complex terrain in large areas.

Discussion

Is China strategically looking for local context to stir up problems with our friends or trying to crowd us out?

Dr. Deal responded that China would prefer to win without fighting, but given obstinacy of the Philippines, Vietnam, and Japan's persistent territorial claims, China's strategy is evolving to showing force in tailored ways to convince weaker regional countries that China is the main power in the region, not the U.S. The question is whether China believes the U.S. will fight to uphold these countries' territorial claims against China. This is dangerous because China can miscalculate our resolve to defend partners or the resolve of countries to make claims. Misperceptions could result in war. History shows that people underestimate the USG's will to intervene in cases where territory or resources are taken. The situation is quite dangerous especially with China's slowing growth. It has a lot of confidence, but is insecure because the world has not acknowledged China's progress.

Does the collateral damage from precision strike weapons work against U.S. interests because it turns the population against it?

Dr. Mahnken responded that the key is perception versus reality. Whether you talk about unmanned strikes or modern warfare, levels of collateral damage and fratricide are really low. The difference is in the past we accepted greater levels of these things because it was the only way to do things. In other democracies, you see increasing restraints on weapons because of this. However, the alternative to drones is not great. The next evolution of competition is moving to more autonomous weapons, which raises a number of legal and ethical questions.

Modern warfare is leveraged by modern media who tries to identify the aggressor. Why is the USG not interjecting into the media that adversaries are not using western ideas of justice and fairness against U.S. forces?

Dr. Deal responded that there are some people in the USG who are trying to respond and create messages. China takes seriously controlling narratives because they feel it shapes how conflicts proceed and resolve. In cases where the U.S. publicizes issues with China, such as a U.S. ship harassed by Chinese forces, the Chinese reaction was quite upset. Other countries are choosing to publicize when Chinese overfly their airspace. This goes both

ways and other countries are trying to respond and shape narratives as well. The role of information in warfare—controlling it and manipulating it—is central in China.

Dr. Mahnken stated that the USG has a universalist culture where we think everyone is the same. We look for similarities and we are a conspiratorial society. Other societies are not that way; they view the world in cultural terms. They tend to accentuate differences. Other parts of world are also conspiratorial.

How do anti-satellite weapons impact conflict in the future?

Dr. Mahnken responded that we could make some alternative assumptions. Many precision weapons require inputs from satellite navigation systems. Satellites are not the only means for achieving precision, navigation, and timing (PNT), but they are more common. One assumption would be that, absent a nuclear explosion in space frying the satellite constellation, space-based PNT capabilities would continue to be robust. However, if space systems become more vulnerable in the future, then an alternative approach would be to have multiple sources for providing PNT. Manufacturers can make weapons that use various sources of information to determine precise location. This diversity would provide resiliency against attacks on part of the PNT architecture. The future is unknown, but periodically evaluating our assumptions about the availability PNT for our weapon systems is key to avoiding surprise.

Panel Two: Social Sciences and their Role in Supporting Future National Security Challenges

The Panel will discuss how best to implement effective socio-cultural capabilities that meet the requirements of commanders, staffs, and policymakers at all levels of the Department of Defense. The panel will address how best to institutionalize socio-cultural knowledge, concepts, methods, analysis, and tools throughout the Defense Intelligence Enterprise. Themes that will be discussed include:

1. How to strategically coordinate the development and implementation of socio-cultural capabilities, particularly analytical capabilities and programs.
2. How to share information about ongoing activities and best practices and to promote synchronization, collaboration, and integration.
3. How to institutionalize socio-cultural knowledge, methods, analysis, and tools throughout the Defense Intelligence Enterprise as appropriate, identifying gaps and solutions.

Panelists:

- Dr. Dan Plafcan, OUSD(I), moderator
- CAPT (Dr.) Dylan Schmorrow, OSD AT&L

- Ms. Nicole Sponaugle, DIA
- Dr. David Adesnik, IDA

Dr. Dan Plafcan, OUSD(I)

Dan Plafcan's work focuses on the integration of knowledge making about societies, populations, and communities into intelligence analysis, national security policy processes, and technological systems. Dan currently serves as a Policy Analyst and Portfolio Manager in the Office of the Under Secretary of Defense for Intelligence (OUSD(I)). In that office, he oversees and develops policies and programs associated with integrating social and cultural analysis into Department of Defense intelligence work across the services, including in intelligence operations, all-source analysis, and technical systems. He chairs the Defense Intelligence Socio-Cultural Capabilities Council, which is a group that is intended to institutionalize effective, coordinated, and efficient socio-cultural capabilities across the Defense Intelligence Enterprise.

Dr. Plafcan congratulated SMA on its ability to bring together various disciplines and people from the social and other sciences time and again on various problems. It opens up a space for conversation that would not happen elsewhere in an operational context.

Dr. Plafcan spoke about the so-called "valley of death" where there are knowledge gaps. In order to eliminate this valley, the mission is to integrate and normalize concepts, knowledge, methods, skills, and tools into all source intelligence that will inform the intelligence and planning cycle form collectors to analysis.

In the IC, socio-cultural analysis is defined as the understanding of people through the lens of understanding communities, populations, and groups. It is not an academic definition because analysts work in the valley of death. The intelligence process is more fluid and conversational rather than the classical model of analysis. There are many ways of making knowledge claims using different standards of evidence. The panelists will address these kinds of knowledge claims from their own perspective.

CAPT (Dr.) Dylan Schmorrow, OSD AT&L

Captain Schmorrow is an Acquisition Professional in the Naval Acquisition Corps and is currently serving in the Office of the Assistant Secretary of Defense (Research and Engineering) as the Deputy Director for Human Performance, Training and BioSystems with purview over the defense technology areas of human performance, medical, man-machine systems, training, civil engineering, environmental quality, and chemical and biological defense. His responsibilities include providing technical leadership, management oversight, policy guidance, and coordination for over $4 billion in research and engineering programs in the DoD to ensure that these areas are focused, relevant, and eminently capable of satisfying current and anticipated defense needs. In this role, he collaborates with the DoD Services, the Defense Advanced Research Projects Agency, the National Science Foundation, the National Institutes of Health, the Department of Homeland Security and other federal agencies to include government, academic and industry researchers in advancing these efforts. He serves

as the OSD Human Social, Culture, Behavior Modeling Program Manager, Executive Secretary for the Defense Science Board Study on Autonomy, and is the Navy Surgeon General's Medical Service Corps Specialty Leader of the Naval Aerospace Experimental Psychologist Officer Community. He also leads international efforts to promote and conduct cooperative scientific research and exchange of technical information through the NATO Research and Technology Organization and is the U.S. National Representative of The Technical Cooperation Program's Human Resources and Performance Group.

CAPT Schmorrow presented a briefing titled *Social Radar—Technologies for a Phase 0 World*. In the new landscape of an increasingly connected world, mass behavior can coalesce with little notice and the USG has to be ready to respond at "Twitter speed." The changing technological landscape and emerging threats means that the USG must focus on Phase 0 to understand the environment, assure allies and deter adversaries.

Significant investments in research and engineering on sociocultural behavior provides the opportunity to connect theories, tools, and technologies forming coherent capability packages, oriented to operational challenges across four capability areas: to understand, to detect, to forecast, and to mitigate.

CAPT Schmorrow directs the OSD Human Social Culture Behavior (HSCB) Modeling Program, which is conducting research to

- develop and deploy technology in support of DoD guidance to defeat violent extremism, deter and defeat aggression by adversaries, and effectively operate in cyberspace;
- deliver operational capabilities to Programs of Record and COCOMs;

- rapidly field warfighter-relevant systems; and
- integrate the best of basic social behavioral science to advance applied research for complex military challenges.

CAPT Schmorrow presented HSCB's Social Radar vision. This long range vision is partially instantiated in prototypes that represent technologies from a range of HSBC

performed and is designed to provide a global and persistent indications and warnings capability that will complement and enhance conventional sensors, use large volumes of open source material, ingest data at scale, and support improved situation awareness, understanding, and decision-making.

Social Radar research will

- forecast instability accurately, reliably, and with enough time to take action;
- detect leading indicators of adversarial intent and behavior while modulating for deception and other "noise";
- show "what if" analyses of alternative Courses of Action, including uncertainty levels;
- measure effectiveness of integrated (kinetic and non-kinetic) Courses of Action; and
- collect, manage, and analyze diverse open source information at scale.

Ms. Nicole Sponaugle, DIA

Ms. Nicole Sponaugle currently serves as the chief of DIA's Operational Environment Analysis Division. This division provides all-source analysis of physical and cultural environments and their effects on the full spectrum of military operations world-wide in support of strategic, operational, and tactical customers; it routinely supports humanitarian disaster and relief operations (HDRO), Non-Combatant Evacuation Operations (NEO), No-Strike Lists (NSL), Collateral Damage Estimates (CDE), and Stability and Support Operations (SASO).

Ms. Sponaugle stated that she represents the analytic community at the DIA. She has always worked in social science related fields. She has had the opportunity of grappling with complex issues within the community from two perspectives: developments (creating new field of analysis) and the integrated perspective of how to combine the physical and social sciences.

Ms. Sponaugle spoke about three key themes that need to be addressed to effectively institutionalize these concepts.

1. Demonstrate operational relevance
2. Develop shared frame of reference
3. Take into account organic capabilities that already exist and augment those rather than create them anew

Ms. Sponaugle stated that the Army taught her that academic theories are great, but their effective applicability is unknown and needs to be explored.

The first challenge at the DIA was a new mission of human factors analysis, specifically, how can the USG understand the adversarial decision-maker? Within DIA, there is a huge variety of disciplines represented. The challenge is creating a shared frame of reference among all of these people and disciplines. Adding the academic community to this problem exacerbates it.

Another problem is that the DoD prefers practical solutions while academia loves elegant things. When academics are told that only a simple tool is required, there is a general sense of disappointment. Academia needs to scale back expectations to meet a customer's skillset.

The DoD needs to establish realistic expectations for social science. Advocates of social science need to clearly identify what social science can and cannot do. There is no silver bullet. One cannot even really "see" social science in the way imagery analysts can see a target. Sometimes the social sciences cross disciplines that have never been crossed before. It requires a lot of effort, but it is worthwhile.

Social science can contribute to the development of methodologies. These will not produce exact, ready answers that the customer expects but they will help inform these answers.

The partnership between academia and the government needs to be seen as mutually beneficial – not a one way flow of information. Analysts can offer empirical validation to refine academic concepts and develop practical tools, thereby provide value to the academic community. Academics provide analytical rigor to operational assessments.

Dr. David Adesnik, IDA

David Adesnik is a member of the research staff at the Institute for Defense Analyses (IDA), a federally funded research center. From Oct. 2010-Oct. 2012, he served as a deputy director and operations research analyst in the OSD/CAPE office for Joint Data Support (JDS), where he focused on Irregular Warfare Modeling & Simulation (IW M&S). His primary responsibility was to serve as lead analyst and action officer for the IW M&S Senior Coordinating Group, a panel of Senior Executives charged with enhancing DOD's IW M&S capabilities. At IDA, David has worked on a broad range of projects related to IW, including a study of the number of troops necessary for operational success in counterinsurgency as well as the design of DOD's first Defense Planning Scenario focused on IW. In late 2007, David deployed to Iraq for four months where he served as a civilian analyst with the Coalition's counter-IED task force.

Dr. Adesnik presented five lessons about the DoD social sciences.

1. The social sciences are not a coherent set of disciplines
2. "Science" is a misleading name
3. You cannot force social science to be more like natural science
4. Social science modeling and simulation (M&S) programs are ineffective
5. Social science provides us with better questions, not better answers

The nature of social science is to challenge the general view of social science that presides in the defense analytic community.

Social science is not a coherent set of disciplines though all social science is both social and cultural. The level of analysis ranges from the individual to populations of millions and providing insights across these levels is something that social science continually struggles

with. These distinctions matter because different problems draw on different disciplines. The DoD is focused on trying to understand populations, but there is a world of social science beyond that.

Understanding what is meant by "science" and "theories" in social science research must be clearly defined, while setting expectations for senior leadership in the DoD. Because of DoD interests, cultural and political understanding is a primary concern. However, the disciplines that study these phenomena are amongst the most qualitative, subjective, and experimental. Therefore, "science" is a misleading name. Within the DoD, science carries with it a set of crucial assumptions, that it is a system of knowledge that has general laws obtained through scientific methods. "Science" assumes the ability to discover fixed laws. When senior leaders talk about adding more science to the study of violent extremism, he or she comes from this perspective. So how can social science respond to these kinds of questions and expectations? Furthermore, "theory" has a fixed definition in science. Political scientists use theories more casually to refer to hypotheses that have some support, though many are not aware of this distinction. There is no agreement on how many studies are necessary before social science hypotheses are considered "proven." This illustrates the confusion about the term "science." In social science, there is no social science lab. Almost everything happens in unique contexts. The democratic peace theory is the closest the field has to a theory, but it is still hotly debated. Pushing social science models to conform to natural science standards is unachievable.

Given the "squishy" nature of social science, the next steps are debatable. One perspective argues that it should be hardened to become more like traditional science. However, a counter-argument is that this would be a waste of resources. Although it is an appropriate goal for scholars to search for fixed laws in behavior realms, the DoD is focusing on more practical issues by looking for laws or theories that it can borrow from social science that apply to real world challenges. The most pressing challenge of this focus is knowing whether to rely on social science models if they cannot be validated and verified. This challenge can be mitigated if it is understood that social science models are meant to inform, not to predict. Finally, just as in other sciences, model creation requires data. This data is based for the most part on common sense. Data needs to be improved to avoid the "garbage in, garbage out" problem. That is, if bad data goes into a model, the results will be bad.

Social science gives us better questions to ask. For example, Lieutenant Colonel (ret.) John Nagl spoke about a police station in Iraq that was continually being destroyed. However, he determined that if he hired friends of the police chief to build the station that it was not repeatedly attacked. He asked different questions and came out with a better solution. If there is one term to capture this, it is rich contextual understanding. Understanding is key. It tells us that by deepening our appreciation, we can see things we would not have seen otherwise, which is the kind of science the DoD should be engaged in.

Discussion

This was a brilliant panel that highlighted two problems. One, what is social science knowledge, how is it structured, and how is it produced? Also, what are the limits of theory? The second challenge is how to take theory, integrate it, and put it into practical action. It requires multiple frames of reference. Both of those are important.

Ms. Sponaugle noted that on the government side, there is a lot of intellectual laziness. It is a difficult problem and DIA analysts do not do a good job of asking the right questions or generating hypotheses. Having a shared frame of reference advances the ability of social scientists to weigh in on complex problems. For example, a phenomenon that appears to be ethnic conflict may really be about water rights. Knowing this from the onset requires a shared frame of reference. A lot of burden is on the government to scope realistic requirements and engage in dialogue. It is not sufficient to punt products over the fence and expect an end product.

Dr. Plafcan stated that users in the government are able to accurately scope a problem according to the needs of end users. Working discursive terrain is not in compliance with doctrine, so by the time it gets to the intelligence community, it lacks integrity. A translation space where decision making around social science actually happens is needed.

Ms. Sponaugle stated that she agreed with Dr. Adesnik's presentation. The bottom line is that expectations from social science are too high. At the DIA, change is underway, but these are not Cold War days. The application of natural science standards to social sciences is not appropriate because one cannot focus on tangible things like tanks and submarines. There is a lot of responsibility on the government and analytic community to clearly formulate requirements.

LT David Combs, Navy, stated that when it comes to social science research, the reason why the desired results (i.e., actionable outcomes) are not seen is because the field is just beginning to be understood. This will be done through continued investment. In the West, Americans are good about influencing ourselves (e.g., television commercials) because we have studied ourselves for so long, but we have not done this kind of work on others. There is a lot of room to grow.

Dr. Plafcan concluded that this panel was not intended to beat up on social science. If the DoD did not have social science, it would be much further behind in facing complex problems. However, further clarity of thought and method is necessary to help the DoD address complex problems.

The Social Sciences and the Valley of Death, Dr. Robie Samanta Roy, SASC

Dr. Robie Samanta Roy joined the Senate Armed Services Committee (SASC) as a professional staff member in March 2010. He has the broad area of responsibility for the Department of Defense's wide spectrum of science and technology-related activities. His primary duties are to advise Members on legislative issues and oversight matters, and assist Members in developing and implementing legislative and policy positions. He came to this position from the White House Office of Science and Technology Policy where he was the Assistant Director for Space and Aeronautics from September 2005 to November 2009 and was responsible for space and aeronautics activities ranging from human space flight to the Next Generation Air Transportation System. He holds a PhD in aeronautics and astronautics from MIT, as well as a Master's degree in Space Policy from the George Washington University and diplomas from the International Space University and Institut d'Etudes Politiques de Paris. Dr. Samanta Roy is currently a Major in the U.S. Air Force Reserve and supports the Air Staff.

Dr. Robie Samanta Roy, SASC, spoke about the importance and changing role of social sciences in the DoD. The changing nature of warfare emphasizes the need to develop a deeper understanding of the human perspective. Conflict is emerging in diverse corners of the world, and the DoD needs to develop expertise in each of these regions in conjunction with the IC. Social science initiatives are crucial for understanding this human terrain. As such, investment in the social sciences needs to continue. It is unfortunate that the current National Strategy for Combatting Terrorism does not contain an explicit reference to the need to foster intellectual and human capital with expertise in the social sciences unlike the 2006 National Strategy for Combatting Terrorism.

There are a number of key issue areas that need to be addressed in DoD social science programs. First, the gap between the research and user community needs to be bridged and narrowed. There are warfighter needs that the academic community can help shed insights on. However, these solutions need to be pragmatic and continual bridges of knowledge transfer need to be established at the tactical, operational, and strategic levels. Second, coordination within the research community needs to improve. Frequent examination of how MINERVA, HSCB, DARPA, and SMA are working together to address warfighters' needs should happen to ensure that the work is not unnecessarily redundant and that there are efficient transitions from basic to applied research. Third, emphasis on multidisciplinary approaches must be maintained and further developed, including bringing together experts from a multitude of fields to ensure multiple perspectives. Fourth, the community needs to do a better job of developing measures of effectiveness (MOE) to understand the impact of activity in areas such as psychological and information operations. Lastly, the community needs to address the verification and validation of high quality data and models and theories.

Budget cuts and setting user expectations will continue to challenge the social science community. Currently, DoD funds $50 million annually in social science research. To ensure this level of funding continues, the value that these programs provide will need to be

demonstrated. In addition, efforts need to continue to set realistic expectations for users for what will be possible.

It is necessary to shape the future direction of social science programs now. This shaping will include the training of future experts to ensure that these efforts are sustainable and the government's investment in academia continues. Additionally, through increases in international cooperation, greater insight on "the other" will be gained and further research into the role of political and religious ideologies needs to be pursued. Finally, the convergence of behavioral science and neurobiology will help inform future challenges including how best to respond to adversaries that do not have the same ethical constraints that the U.S. does.

Discussion

If we have the core question wrong and are focusing our efforts on the conflict phase of war, how do we prepare for preventing war especially at the interagency level?

There are efforts through the National Science and Technologies Council's Human Factors Working Group, that attempt to focus research to answer questions through interagency cooperation. Although the DoD engages in conflict, it is not where it would like to engage. Maintaining Phase 0 is the most desirable for all actors.

Since social sciences are ideas, not hardware, how do you see social science informing technology?

Social science can help answer questions such as, "what courses of actions should we take?" Additionally, social science can inform the development of accurate language translation tools down to the dialect level. In addition, there are ongoing programs asking if computational models can extract sentiment from data. However, there is still a lot that needs to be done on big data issues to parse out trends.

How do we measure effectiveness? In the social science, what is the sense that we are able to measure it?

This is a function of commanders' guidance and the COCOMs ability to use the product that is given to them. The operators need to understand their theater and social science is another tool in their non-kinetic toolbox to utilize to be the most effective warfighter they can be.

Panel Three: Populations in their Environments: What Can Remote Sensing Tell us About Stability and Resilience?

This panel explores the simple question: In what ways can remote data collection of the Earth's environmental factors and population dynamics reduce the collection demands for assessing local, state, and regional stability? We will explore the two ends of the spectrum of human-induced patterns: the better understood sparsely populated agricultural areas and less known conditions in megacity slums. Principal areas for consideration include population demographic characteristics including size, housing, economic activity, as well as public health, wellbeing, economic capacity, civil military operations, and governance. The analytic challenge lies in breaking down these variables, determining proxy indicators as needed, and then using these to assist viable models and frameworks that can provide insights about the projected dynamics of a rural area or megalopolis.

Panel members:

- Dr. Charles Ehlschlaeger, USACE, ERDC, Moderator
- Dr. Amy Pate, University of Maryland
- Dr. Karen Owen, George Mason University
- Dr. Molly Brown, NASA

Dr. Amy Pate, START

Dr. Amy Pate is a specialist in international relations and comparative politics, with particular foci on ethnic conflict and democratization at the University of Maryland's National Consortium for the Study of Terrorism and Responses to Terrorism (START). Her research focuses on ethnic conflict in the context of democratization, ethnically based terrorism and state stability. She has extensive experience in the development and management of large datasets, serving as project coordinator (2003-2005, 2006-2007) and research director (2007-present) for the Minorities at Risk Project. In this role, Pate supervises all data collection for the Minorities at Risk core and organizational behavior datasets. Her recent projects include work on USAID's Alert List, articles on democratization for Peace and Conflict 2008 and Peace and Conflict 2010, and work on the tactical choices of militant ethnopolitical organizations in the Middle East and North Africa.

Dr. Pate presented her research on the open-source indicators of sub-national political instability. The research focuses on minorities at risk, organizational behavior, Pakistan organized crime, and Jordanian protests. All of these focus areas rely on open-source data collection, especially from media using standardized collection methods. Her research also seeks to better understand, conceptualize, and measure risks to political stability.

The research is based upon the idea that individuals who have a democratic ideology are less likely to engage in terrorism. Organizations with separatist ideology use rhetoric supporting violence. Organizations with foreign government support or have recently been suppressed by the government are likely to be violent.

One dataset used in this project is the Minorities at Risk Organizational Behavior (MAROB) dataset[4], which looks at the political behavior of ethnic minorities. This is done by examining organizations that form and mobilize around ethnic identity. It is important to note that ethnic groups are not monolithic nor are the groups that claim to represent them. The MAROB dataset has identified risk factors to violent political behavior including sustainable protest, insurgency, regional concentration, autonomy by leaders, suppression by government, and transition to democracy.

The organized crime in Pakistan study examined open sources in English and Urdu, then created qualitative profiles for 11 groups and conducted social network analyses. The study then compared scores from the threat assessment tool to political stability. The aggregate findings show that Tehrik-i-Taliban Pakistan (TTP) and the Haqqani Network are the most violent groups in Pakistan and that hybrid political-criminal organizations are the most dangerous.

Dr. Pate concluded that what matters across any study is the quality of the sources used to ensure good results.

Dr. Karen Owen, GMU

Dr. Karen Owen works as a strategist, analyst, and scientific researcher in the field of human geography at George Mason University. She received her PhD in Geography and GIS from George Mason University and has published in the scientific literature on geographic access to healthcare, invasive species predictive modeling, informal settlement differentiation from imagery, and image-based metrics to weight slum severity in developing countries. Her latest research includes remotely measuring neighborhood-scale slum severity in megacities. She volunteers regularly on medical missions to Guatemala, where she conducted her PhD field research.

Dr. Owen presented her research on populations and their environments using imagery to understand human settlements. Proxy indicators that can be derived from imagery include health, quality of life, accessibility of services, population density, built-up density (number of buildings), neighborhood economics, and proximity to hazards. The amount of vegetation, type of roof surface material, and road surfaces are all correlated with different levels of wealth. For example, affluent areas have more concrete roofs and more vegetation. Remote sensing contributes to measuring stability through the ability to search for pockets of wealth or poverty, identify neighborhoods of highest need during crisis, and geolocate zones of economic desperation. Through fusing imagery-based indicators with social science models, trends and outcomes can be informed.

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[4] The first release of MAROB data covers 118 ethnopolitical organizations representing 22 MAR groups in 26 countries of the Middle East and North Africa from 1980 to 2004. http://www.cidcm.umd.edu/mar/data.asp

Dr. Molly Brown, NASA

Dr. Brown received her BS in Biology at Tufts University, MA and PhD in Geography from the University of Maryland at College Park. She also served in the Peace Corps from 1992-1994 in Senegal. Her dissertation research focused on integrating satellite remote sensing information into econometric models to predict variations in local food prices in West Africa. In 2008, she published a monograph with Springer-Verlag entitled 'Famine Early Warning Systems and Remote Sensing Data'. In 2008, she joined NASA Goddard Space Flight Center in the Biospheric Sciences Branch. Her research focuses on expanding the use and utility of satellite remote sensing observations and earth science models for decision support. She is currently working with NASA's Soil Moisture Active Passive (SMAP) and the ICESat-2 missions, and is on the Science Definition Team of NASA's Carbon Monitoring System (CMS).

Dr. Brown spoke on the use of remote sensing in detecting food security crises. The Famine Early Warning System Network (FEWS NET) is a USAID program that warns decision makers of slow-fuse food security crises where it often takes up to 9 months to move food into an area. The objective of this program is to provide quantitative and objective information to convince decision makers to act. FEWS NET utilizes remote sensing data in multiple ways including objective analysis of hazards for early warning of crises, identification of potential changes in agricultural production, and identifying the changing value of assets.

Controversy in food security crises comes not because no one knows there will be a crisis, but because of disagreement over the appropriate intervention. Intervention can only occur when all actors agree on a solution. Knowing that a crisis is going to occur and require intervention requires relating agricultural production to household food security. Forming this relationship is dependent upon understanding sources of income and integration of household into markets. For example, the impact of reduced rainfall and abnormally dry conditions in East Africa in 2011 was significant food declines in food production in the region. Satellite remote sensing provided early and clear warning of the resulting food security crisis in the region as a consequence of poor agricultural growing conditions. FEWS NET was able to issue appropriate and accurate warning of a severe food security crisis in Somalia, Kenya and eastern Ethiopia as a result of the use of remote sensing data along with economic, political and nutrition analysis that enable a quantification of the impact of production declines on household food access. Understanding early indicators of food crises can position the USG to be better prepared to respond.

Dr. Chuck Ehlschlaeger, USACE ERDC

Dr. Ehlschlaeger received his Ph.D. from the University of California at Santa Barbara in 1998. After 14 years in academia performing theoretical and applied research in technical geography, he returned to the Army Corp of Engineers Research and Development Center (ERDC) in Champaign IL to do applied human geography research in demographic modeling, visualization, and social cultural simulation models. Dr. Ehlschlaeger is currently the technical lead on ERDC Capacity Development Research grant exploring ways for agent based

simulation models to enhance Civil-Military operations. He also occasionally teaches a class at the University of Illinois in Urbana.

Dr. Ehlschlaeger presented the planned Megacities project. The goal of this project is to assist in Phase 0 stability operations, far left of the bang, and to build a global social-cultural monitoring forecasting system. This monitoring system will use analysis informed by demographic information including census and ground surveys. This demographic information will be used with conditional simulation to simulate all household and people in the study area to identify regional and local patterns over time to assist in COCOM planning.

Discussion

How expensive is NASA's FEWS NET and how long does it take to produce a product?

Dr. Owen responded that due to the nature of her project, information needed to be known ahead of time. However, the only inputs that were necessary were high-resolution satellite photos. The cost is not significant.

Dr. Ehlschlaeger noted that in terms of demographics, the farther left of the boom, the cheaper information collection can be done, and the information is higher quality as well: it is far more costly for USG to contract population surveys than to assist partner nations to conduct their own censuses. However, some countries are too unstable for census, requiring population surveys. USG already contracts population surveys in important AOIs. The demographic information is not exploited to its fully potential. Unfortunately, census data can be biased. But, understanding biased census data will help inform partner nation attitudes to their population. Geo-temporal analysis for social sciences research in academia can improve DoD social science related operations.

Can you comment on the differences between the difficulties of social sciences and fairly straightforward geospatial analysis? Will the future of social science research be less demanding?

Dr. Brown noted that geospatial analysts are careful to say that satellite remote sensing cannot tell us when someone is hungry. The analysis is based on quantitative relationships. Based on these indicators, it is possible to get a good idea if someone is hungry and if there is food security in the region. Analysis can tell what the cause, consequence, and appropriate response is, but it cannot predict if a war will break out.

Dr. Owen stated that imagery can give context for what is going on systematically, but this cannot be distilled to an individual level without further analysis.

Dr. Pate said that some individuals are still looking for a silver bullet and think that geospatial analysis is it. However, geospatial analysis is akin to epidemiology where there

are multiple pathways to one outcome and one pathway to disparate outcomes. The goal is to remove the noise in the data and ask what the areas of the highest risk are.

Dr. Ehlschlaeger concluded that geospatial analysis will increase, and as more data becomes available, interesting insights will be uncovered.

Panel Four: Minerva Priorities for an Uncertain Future: Defense Basic Research and Minerva

Defense social science basic research uses rigorous methodology to investigate the why and how, versus who or what, for mission-relevant questions such as the cultural context and motivations for violent extremism and contributors to social conflict and stability. The Minerva Research Initiative, DoD's flagship social science basic research program, works to effectively target its research solicitations at those knowledge gaps that will be most critical for the warfighter, the force planner, deployment and doctrine, and national security policy development. This panel will address questions such as: Given the inherently open time horizon of basic research, how can the basic social science research community anticipate the social and cultural constructs whose understanding will be most critical for tomorrow's warfighter? What roles do large, multidisciplinary research teams versus small, more scoped efforts play in advancing the field? How can insights from basic social science research efforts most effectively be connected to policy and operational communities**?**

Panelists

- Dr. Erin Fitzgerald, Minerva (moderator)
- Dr. Pauline Kusiak, OSD(P)
- Dr. Antulio Echevarria, Army War College Strategic Studies Institute

Dr. Erin Fitzgerald, Minerva

Dr. Erin Fitzgerald works in the Basic Research office within the office of the Assistant Secretary of Defense for Research and Engineering. Through ASD(R&E) she directs the Minerva Research Initiative, a $15M university-based basic research program with the goal of improving fundamental understanding of the social and cultural forces that shape regions of the world of strategic importance to the US.

Dr. Fitzgerald presented a briefing entitled, *Preparing for an Uncertain Future: Defense Basic Research and Minerva*. She stated that the DoD invests in basic research because it probes the limits of today's understanding and technologies and discovers new phenomena and know-how that ultimately lead to future capabilities. Additionally, basic research funding attracts some of the most creative minds to fields of critical DoD interest. Furthermore, basic research provides a broad perspective to prevent capability surprise by fostering a community of U.S. experts who are accessible to DoD and who follow global progress in both relevant areas as well as those that may not seem relevant—until they are.

Foundational knowledge of cultural and political environments will lead to better capabilities in, for example, assessing radical actors and trends and anticipating the impact of regime disruptions. Basic research in the social sciences builds cultural and foreign area knowledge and creates insights to inform more effective strategic and operational policy decisions by war planners and warfighters. It leverages and focuses the resources of the nation's top universities toward fields of critical DoD interest. Finally, it fosters a community of subject matter experts in regions and social science topics of known interest—and what may be of future interest. These goals inspired the Minerva Research Initiative.

The Minerva program aims to generate deep understanding of social and cultural forces shaping regions of the world of strategic interest, especially to help decision makers identify and mitigate factors that might become sources of future conflict. To best accomplish the latter goal Minerva must persistently anticipate and target areas of future interest. For all fields, DoD tries to predict which research investments today will yield the greatest long-term benefit for the future warfighter. Minerva watches social science disciplines for rapid progress and seeks out developments in areas of high DoD need. The program works to elicit future requirements from potential strategic and operational consumers of generated insights. Minerva also seeks research initiative ideas from the smart people they interact with at academic workshops.

Minerva topics have evolved over time to three focus areas designated for 2013: belief formation and movements for change, models of stability and change, and new theories of power and deterrence.

- Belief formation and change
    - Belief formation and influence
    - Group identities and cultural norms
    - Movements for change
    - Collaboration and competition between violent groups
- Models of stability and change
    - Economic and governance factors
    - Energy, environment, and resources
    - Demographics and other factors
- New theories of power and deterrence
    - The role of the state in a globalized world
    - Norms and governance
    - Beyond conventional deterrence

Dr. Pauline Kusiak, OSD(P)

Dr. Pauline Kusiak is a foreign affairs specialist in the Office of the Under Secretary of Defense for Policy (OSD(P)). In this position, she has worked in the areas of strategy, stability operations, special operations, and combating terrorism. Dr. Kusiak was the first program manager for the DoD's Minerva Initiative, a basic social science research initiative launched by Secretary Robert M. Gates in 2008. Before joining OSD, she worked as a social and cultural research specialist for the U.S. Army Special Operations Command at Fort Bragg, NC. Pauline currently serves as Regional Director for East Africa, in OSD ISA / African Affairs.

Dr. Kusiak spoke about the origins of the Minerva research program. When Dr. Kusiak arrived at the Pentagon, Minerva had been moved out of the box. She was a socio-cultural research analyst who was detailed to the strategy office of OSD(P). Many things were crafted before she started. Many people working on socio-cultural analysis at the time emerged from a Cold War background and had a different idea of what policy makers wanted. Deep area expertise started to disaggregate after the Cold War within the DoD.

In OSD(P), analysts who had been a deep area expert for 25 years were moved because the world had changed and the desire for flexibility increased. Minerva was created to help the DoD thinking intensively and adaptively about today's socio-cultural problems.

Minerva was modeled after the early days of the Department of Defense in the 1950s and 1960s when the DoD was much smaller. OSD(P) was originally just focused on intelligence and security affairs. However, in the 1980s, the office expanded to policy as well. Minerva wanted to recreate a collegial environment for information sharing and analysis. It also sought to rebuild strong ties to academia to recreate an environment where academics were comfortable telling officials things they did not want to hear. Minerva went back to basics and started to work from social science theories.

Minerva tried to balance the desire for academic discovery against defense needs. Like most things in policymakers, it is a top-down process. In addition, at the time, Iraq was of most interest. Therefore, Minerva initially focused on Iraqi behavior. Minerva has evolved and refined its research projects. It now has a focus on three areas: belief formation and change, models of stability and change, and new theories of power and deterrence.

Academics do not hold all of the answers. What they find is interesting and provides alternate views. One way to enhance the relevance of academic research to the DoD is to bring in young scientists to do a rotation at the DoD, so that they are primed with DoD needs when they go back to start their research. In addition, DoD analysts should be encouraged to publish online, which increases intellectual curiosity.

Dr. Antulio Echevarria, U.S. Army War College

Dr. Antulio J. Echevarria II became the Director of Research for the U.S. Army War College after a military career of 23 years. He has held a variety of command and staff assignments in Europe and the United States. Dr. Echevarria is the author of Clausewitz and Contemporary War (Oxford University Press, 2007); Imagining Future War (Praeger Securities International,

2007); and After Clausewitz (University Press of Kansas, 2001). He has also published extensively in scholarly and professional journals on topics related to military history and theory and strategic thinking. Dr. Echevarria is a graduate of the U.S. Military Academy, the U.S. Army Command and General Staff College, and the U.S. Army War College, and holds M.A. and Ph.D. degrees in history from Princeton University.

Dr. Echevarria introduced the work done at the U.S. Army War College and identified key strategic issues for defense. The Strategic Studies Institute (SSI) of the U.S. Army War College publishes national security and strategic research and analysis, which serve to influence policy debate and bridge the gap between Military and Academia. SSI conducts independent, policy-oriented analysis. The organization has the latitude to reach conclusions and create publications that may not be consistent with U.S. policy or doctrine. SSI publications often target military education students. Often, students have more time to think, read, and ingest than policy and decision makers.

Discussion

People expect too much from social science; however, the real issue is that people expect the wrong things. Social science is not forensics nor is it not predictive modeling, though it may contribute to those things. It is the disciplined study of the social world. It explains how and why things happen to human systems and populations.

She added that within the DoD, people groan when you bring in academics because there is a disconnect between the elegant, formal solutions of academic and the requirements-driven government side. However, with the appropriate liaison, a bridge can connect the gap.

One participant noted that the need for rich contextual analysis also requires social science methods, qualitative analysis, and case study. Academia's potential contribution is generally not understood by DoD strategists and operators, so they are unable to identify that it needs this kind of analysis. Furthermore, academics are so disconnected from the needs of the defense community that they themselves do not necessarily understand what knowledge gaps their research might fill. There has to be a better mechanism for outreach. One solution is to encourage more internships to provide future academics with greater defense context. There should be a summer program for graduate students from different fields who are interested in doing dissertation work in the defense field. The DoD could start this program by recruiting leading professors in social science disciplines.

One participant asked how to verify and validate social science models. It is a problem that the field has been struggling with. Dr. Astorino-Courtois argued that this question highlights the difference between social science and hard science. Social science is a nascent discipline. The models and the underlying constructs are yet to be developed. Hopefully, social science will become more forensic, but for right now, it is not. There are very few areas in social

science that have laws or universals. The question about verification and validation in the physical sciences sense is premature.

Feedback from Commands: What are the pressing needs in your Commands?

This panel provided an opportunity for representatives of the Commands to provide feedback on SMA activities and present their pressing needs to the SMA and social science community. It also serves as an opportunity for academic participants to gain a better understanding of Command needs and how their research might be applicable.

The macro-level trends over the next one to three years are going to be budgetary, in a resource-constrained environment, what are the priorities? What are near term challenges, and what is the "black swan"? When discussing global trends, focus on the pivot to China and consider geography, trade relations, maintenance of lines of communication, economic growth, India, and North Korea.

Panelists

- Brig Gen Timothy Fay, JS, J36, Moderator
- COL Mike Albaneze, PACOM
- LTC John Ferrell, SOUTHCOM
- Mr. William Busch, EUCOM
- LTC Ari Kestner, JS/J-3/DDSO
- Ms. LeAnne Howard, SOCOM
- Bryan Cannady, SOCOM/CSIS

Brig Gen Tim Fay, JS, J36 noted that SMA is able to bring a lot of different perspectives and individuals together in order to support COCOM needs.

COL Mike Albaneze, PACOM

COL Albaneze was commissioned in the US Army Field Artillery in 1984 upon graduation with a BS in Economics from Clemson University, Clemson, South Carolina. He has served in airborne, air assault, and light infantry units. He served a tour in the Pentagon as a force planner and was present there during the attacks of 9/11. His combat tours include the first Gulf War, OPERATION ENDURING FREEDOM in Afghanistan, and OPERATION IRAQI FREEDOM. He has served as the Effects Coordinator for Special Operations Command, Pacific, then served as the Director, Operational Maneuver Directorate, Main Command Post, US Army, Pacific. COL Albaneze graduated in November 2009 as the US student from the India National Defence College in New Delhi, India. His awards and decorations include the Defense Superior Service Medal, Bronze Star Medal with two oak leaf clusters, Meritorious Service Medal with five oak leaf clusters, Air Medal, Army Commendation Medal with three oak leaf clusters, Army Achievement Medal with two oak leaf clusters, Joint Meritorious Unit Award, Valorous Unit

Award (2), Meritorious Unit Commendation, Army Superior Unit Award, the Master Parachutist and Air Assault Badges, and the Army Staff Identification Badge.

COL Albaneze presented pressing needs in PACOM's area of responsibility (AOR). The current challenge is ensuring that the rebalance to the Pacific is effective and complete. The rebalance toward the Pacific requires examining China's rising power, North Korea's leadership change, and the strategic partnership with India, and South Asian stability.

The rebalance emphasizes the need for increased COCOM cooperation and consistency. Addressing Pakistan and India requires collaboration between PACOM and CENTCOM. These commands must give consistent messages to the affected governments and populations. Synchronizing the U.S. message across all mediums, including the Internet, is vitally important.

China's rise has created new challenges in our understanding of the region including its relationship with India, including increasing power competition and boarder challenges. The US wants stability throughout the region and this will come through security cooperation and continued relations with India.

When considering the future, complex issues such as military modernization, populism, rule of law, and trade partnerships are increasingly relevant for PACOM.

LTC John Ferrell, SOUTHCOM

LTC Ferrell is currently assigned as the Deputy Science Advisor for U.S. Southern Command in Miami, FL. Here, he manages multiple science, technology and experimentation projects and programs to develop and deliver new technologies and concepts to support the command, components and task forces operating in the AOR. John manages the Joint Capability Technology Demonstrations (JCTDs) program, and also supports joint experimentation and special projects. These programs are currently providing intelligence, situational awareness, satellite communications, renewable energy, telemedicine, water purification and information sharing capabilities to the command.

LTC Ferrell noted that SOUTHCOM is a smaller command that has been faced with limited resources for some time and, due to this, has become one of the premiere COCOMs for interagency and regional cooperation and understanding. Cooperation is not just about sharing information but about sharing processes and means of accomplishing U.S. and partner nation goals. It is difficult to share some information through technical means, but programs are under development to solve this problem. SOUTHCOM will work to increase effectiveness and efficiency through continued regional and interagency cooperation by developing more streamlined processes for synchronizing COCOM and USG efforts in the region.

Mr. Bill Busch, EUCOM

Bill Busch is the Chief, Deep Futures section, Strategy Division, Intelligence Directorate, U.S. EUCOM. He oversees Deep Futures research, analysis and the "contextualization" of knowledge on the European operational environment in support of Deep Futures risk and opportunity analyses. Mr. Busch joined EUCOM in 2007 after retiring from the USAF as a Lieutenant Colonel. Upon his arrival, Mr. Busch was responsible for developing the EUCOM Theater Intelligence Strategy. This position evolved into the Deep Futures lead.

Mr. Busch stated that current issues facing EUCOM include

- Russia benefiting from high oil prices;
- the NATO budget under pressure in a "post"-Libya environment;
- increasing stress on economies;
- increasing energy needs;
- aging demographic; and a
- reduction of U.S. presence in Europe.

Given this characterization of a near-term future, where is NATO headed?

One unique aspect of EUCOM is the lack of an identifiable enemy, and this has caused some conflict in the command. As resources are redirected out of EUCOM, the command is struggling to define its mission.

From a NATO perspective, Article 5[5] is being re-emphasized while operations are being deemphasized. There is no enthusiasm to get involved in operations. EUCOM has tried to build capacity in Afghanistan but is now asking, "What do we do with this capacity and should we, or can we, maintain it?"

The issues presented are not what a COCOM is used to dealing with, and it is difficult to view them non-kinetically and align these issues with the mission.

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[5] Article 5 states "The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area. Any such armed attack and all measures taken as a result thereof shall immediately be reported to the Security Council. Such measures shall be terminated when the Security Council has taken the measures necessary to restore and maintain international peace and security." http://www.nato.int/terrorism/five.htm

LTC Ari Kestner, JS/J-3/DDSO

LTC Kestner was asked to respond to the question, "For CENTCOM, looking at the activity in Afghanistan, the draw down, Iran, youth bulge, Syria, Iraq, and fiscal pressures, what is prioritized?"

LTC Kestner stated that CENTCOM is concerned about the drawdown in Afghanistan, Iran, the regional youth bulge, Syria, Iraq, and fiscal pressures. These issues all affect regional stability in Central Asian states—stability that the USG would like to see increase. Violent extremist organizations (VEO) may focus on regional instability, including the exploitation of Syria, Yemen, Somalia, Mali, and the greater Middle East and North Africa. VEOs may also exploit the troubling trends in Sunni/Shia splits in the Gulf. The nexus of terrorist organizations and how their cooperation calls for greater examination, as well as increased study of the splintering and merging of various groups. Finally, Pakistan, the risk of growing extremism, and the security of its nuclear weapons is a CENTCOM priority and needs further study.

Ms. LeAnne Howard, SOCOM

Ms. Howard was asked to respond to the following question, "Over the last decade, the focus has been on counter insurgency, but with the current fight closing and the fact that special operators take a lot of time to train, not to mention shrinking budgets, what is the relationship between traditional and special operations?"

Ms. Howard responded that the nation needs an increase in special operation forces (SOF) because they respond to small and tough missions with a high return on investment. The greater the preparation, the quicker a force will be able to respond to a threat. Building partnership capacity and indirect links of SOF can increase the agility of the COCOMs. The ability of SOCOM to operate in a resource-constrained environment could be based off a stronger SOF and NATO partnership. This partnership could be started through the creation of doctrine outlining what each member nation could bring to the table.

SOCOM must remain specialized to ensure that there is the ability to respond quickly to mission sets and calls that are coming to support the COCOMs. Systematic understanding of trends is necessary as well through study of wealth, identity, and influence. The community is pushing for strategic, not just tactical, assessments. SOCOM plans to expand the scope of action and create deliberate plans against transnational and global threats, not just counterterrorism operations.

COL Bryan Cannady, SOCOM/CSIS

Colonel Bryan H. Cannady is currently serving as a Defense Fellow at the Center for Strategic and International Studies in Washington D.C., following a tour on the Joint Chiefs of Staff, J-3 Operations, Deputy Director of Special Operations and Counterterrorism. Colonel Cannady has spent his career in Special Operations as an Air Force Special Tactics Officer. He commanded

Special Tactics forces on combat missions during Operations PROVIDE COMFORT, DESERT THUNDER, ENDURING FREEDOM, ENDURING FREEDOM Philippines and IRAQI FREEDOM

COL Cannady, Defense Fellow at CSIS, described the myriad of national security trends under this administration including the introduction of drawing down the defense budget while simultaneously stating the need to increase ability to influence. With long-war fatigue, the American public will continue towards isolationalism insisting on solving domestic problems before engaging in campaigns to police the world. Policing stability in regions will be seen as too high of a cost unless risk to U.S. interests in that area are deemed catastrophic to the nation. The stated "pivot" to Asia/Pacific might be better framed as simply a strategic statement of intentions to let China know that the U.S. will keep them in check. This public shift does not reflect the reality of the next 10 years with increasing tensions in the Middle East, North Africa, and South Asia. Additionally, since the DoD is a completely efficient planning agent, DoD continues to make headlines for its planning effort. The Administration is not changing this narrative nor has the Department of State sent a different message thus the DoD's Air-Sea Battle and various other planning efforts frame the nation's effort in the Pacific. A realistic view of the future needs for DoD includes a combination of all Geographic Combatant Commands needs adequately prioritized with the DoD's fiscal drawdown. This effort must be synchronized both operationally and strategically. This synchronization should include an assessment from Department of State and other interagency partners to ensure an efficiency of effort. This analysis should be conducted for each theater and the results should promote interagency cooperation. This cooperation will be very difficult and capitalizing on personal relationships may make cooperation easier. Finally, while conducting assessments, we must first understand the nature of the problem *and* how to influence it. There needs to be better integration, education, and cultural changes within and among agencies to better understand influence and to be more effective fighters.

Discussion

Of the pressing threats, what is most likely and how do COCOMs prepare for that given resource constraints?

Mr. Busch responded that the most pressing national security threat is currently the economy. However, as the economy dictates a smaller force, the U.S. military will not be any less effective. Red lines will change as will the look of the force. Force structure and modernization will need reform as the budget continues to shrink and assessment of what is critical will be emphasized.

COL Albaneze stated that as China continues to rise, the U.S. should continue to compete with China without pushing into an adversarial role. The DoD should not create an enemy simply because there is not one right now. The shift to the Pacific is an opportunity to engage with international partners. The way that China is viewed will drive modernization efforts. The DoD is concerned because modernization is driven, to a large extent, on how it look at China. Cyber security is playing a large role right now because of China's gigantic

online presence. However, the DoD is struggling with how to translate this into a long-term strategy. A balance needs to be struck between high and low end force structure. The high-end includes threats such as North Korea and Iran while low-end threats are mainly counterterrorism efforts. The force structures of these are very different and unlimited resources cannot be invested in both of these.

Is the goal to see China as a competitor not as an adversary? China is showing strategic force in the region but what does this really mean?

COL Albaneze responded that the goal is to create space for China to become a competitor, not a challenger. Many think of China as a monolithic entity, but that is not the case. There are worries of internal stability and this drives the force structure of China. The focus of their force modernization is the navy. The potential threats in the region must be managed to ensure that China does not become a true enemy.

Panel Five: Disruptive or Diffusive Technologies? Understanding the Impact of Technology on Individual Empowerment

Societies and cultures are absorbing new technologies at an accelerating rate. This technological growth will empower individuals to mobilize and communicate at such a rapid pace that governments and societies will struggle to adapt. This panel explored the implications of information communication technology on the developing world, how accessing development technology will provide us with new ways to follow public opinion in real time, and provided a level of transparency to governance that have the potential to destabilize regimes who fail to keep pace with the demands of their citizens and electorate.

Panel Members:

- Mr. Chris MacPherson, OUSD (P), moderator
- Mr. Jeff Moss, Vice President and Chief Security Officer of the Internet Corporation for Assigned Names and Numbers (ICANN)
- Mr. Andrew Cedar, Director for Global Engagement on the National Security Staff at the White House
- Ms. Yasmin Dolatabadi, Principal, Google Ideas

Mr. Chris MacPherson OUSD (P)

Currently a Foreign Affairs Specialist in the Office of the Deputy Assistant Secretary of Defense for Combating Terrorism and Special Operations, Christopher covers portfolios related to Information Operations, Countering Violent Extremism, and Congressional Engagement. Christopher has over a decade of professional experience in the U.S. national security arena. Prior to joining OSD Policy, Christopher was a Presidential Management Fellow with the Office of the Secretary of Defense. In 2010, Christopher spent eight months in Afghanistan, where he

served as the information operations officer for an infantry battalion and agribusiness development team in Laghman Province, as well as on the International Security Assistance Force's Information Operations Task Force in Kabul. Christopher received both the Global War on Terrorism Civilian Service Medal and the Department of the Army's Commander's Award for Civilian Service for his time in Afghanistan.

Mr. MacPherson noted that he has been working on IO projects related to SMA issues for a number of years. SMA is an intellectually interesting and useful effort to analyze hard problems facing the DoD. The SMA team facilitates both meaningful discussion and products. Dr. Cabayan has an incredible ability to crowdsource across a range of actors. When Dr. Cabayan asked him to moderate panel for this conference, he thought it would be interesting to approach these kinds of hard problems from a difference perspective: How do individuals and organizations outside the DoD deal with complex problems in the information environment?

Mr. MacPherson invited three individuals to describe their approach to solving complex challenges in the information environment. The panel discussed the rate of change in the 21st Century and the changing scope of problems that need to be addressed both in the United States and overseas. Looking at recent events where a YouTube video incited protests abroad, having an informed position on how violence is manifested and how the information environment contributes to that violence is important. The United States Government (USG) needs a better understanding of how to respond to events in an informed way that does not exacerbate the situation.

Ms. Yasmin Dolatabadi, Google Ideas

Yasmin Dolatabadi is the Principal at Google Ideas responsible for driving the think/do tank's strategy and operations. Yasmin also oversees the team's work on counter-radicalization and weak/failed states. She recently led a cross-discipline coalition to launch the world's first network of former violent extremists and survivors of terrorism, to connect them to each other and to the thought leadership and resources of the private sector. She is co-chair of the European Commission Working Group on Online Radicalisation. She is a seven-year veteran of Google, assuming key roles as Sub-Saharan Africa Operations Manager and Head of Sales Strategy and Operations for Southern Europe, Middle East, and Africa.

Ms. Dolatabadi briefed the conference about one of Google's newest organizations, Google Ideas. Google Ideas is a think/do tank that convenes unorthodox stakeholders, commission's research, and seeds initiatives to explore the role that technology can play in tackling some of the toughest human challenges. [6] Of particular interest to this conference is Ms. Dolatabadi's work with the failed states and counter violent extremism program at Google Ideas.

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[6] http://www.google.com/ideas/

Ms. Dolatabadi stated that this panel is at the heart of what her team does. Google Ideas operates as a think tank inside of a technology revolution, and is neither a commercial nor a philanthropic organization. It has a bias towards building things. Google Ideas focuses first on global challenges and tries to understand them through information technology. Its mandate is not U.S. national security, although there is significant overlap in some areas such as illicit networks, failed states, and violent extremism.

Ms. Dolatabadi shared two demonstrations. The first demonstration provided a visualization of UN customs data on small arms trade including imports, exports, military weapons, civilian weapons, and ammunition.[7] One interesting finding was that trade in ammunition is large and needs more attention than it is given today. The tool visualizes net importers and exporters of arms. For example, Pakistan is a net importer and is primarily dependent on the U.S. for those imports. In Mexico, there has been an uptick in imports since 2006 when the Mexican government declared war on the drug cartels.

In the second demonstration, Ms. Dolatabadi demonstrated a network analysis visualization, created in conjunction with Al Jazeera, of Syrian government defections.[8] She argued that it is defections that end a regime, not the death toll. The visualization showed the regime's three pillars of support with each node representing a person. The red nodes represent individuals who have defected. Each node contains a video of each individual describing why he or she defected.

Google Ideas works across a broad range of issues. It does not think it can parachute in as a tech company and solve these complex problems, but it can provide tools that help others do so.

Mr. Jeff Moss, ICANN

Jeff Moss is the Vice President and Chief Security Officer of the Internet Corporation for Assigned Names and Numbers (ICANN).Moss has been a self-proclaimed hacker for over 20 years. In 1992, Jeff founded DEF CON, the largest hacker community and gathering in the world. Five years later he started the Black Hat Briefings, a series of technical conferences featuring the latest security research that have been held around the globe, in locations such as the Netherlands, Spain, the United Arab Emirates, Japan, Hong Kong, and Singapore. Throughout his career he has used his skills and understanding of the hacking community and its methods to help organizations secure their global networks.

Mr. Moss described a hypothesis of the four main cyber actors. The first set of actors is nation states. They generally want secrets or to verify secrets. The second set of actors is transnational criminal organizations (TCOs) that want money, not secrets. These two

[7] See http://workshop.chromeexperiments.com/projects/armsglobe/ for the demonstration
[8] See http://www.aljazeera.com/indepth/interactive/syriadefections/ for more information.

groups are nearly opposites of each other. States do not want money and TCOs do not want secrets—it is too hard to sell secrets well. The third group is protestors. They seek attention to their cause. The last group is hackers and researchers. This group wants knowledge. They are generally not politically motivated, nor are they motivated by secrets or attention; they just want to learn. They are the group that discovers new classes of vulnerabilities and shares them with the world. They drive companies and organizations to focus on product security. There are few sources of unbiased information about the security of commercial products and hackers are one of them. They are also one of the few groups that spur discussions of national security. The other three groups do not tell you about vulnerabilities or spur debate.

Mr. Moss suggested that there might be a fifth group. All of the four groups listed above need the Internet to work to achieve their aims, but what if a group wants to bring the network down? If this fifth group is successful, how will the other four groups fare? He does not know if this group actually exists, but it is an interesting idea.

Mr. Moss then noted a trend towards specialization. If one looks at the trajectory from the industrial age to the information age, there is a movement towards increased specialization. It used to be that five knowledgeable people could take down the Internet. Now, it takes 100 people just to understand Java Script. As information technology has become specialized over the decades, it has not secured the old technologies against new threats. He asked what strategies are available for dealing with these risks. In investing, specializing (i.e., only buying Apple stocks) can give greater returns at much higher risks compared to diversifying. What are some of the risks the government, industry, and society are willing to deal with?

Ross Anderson famously said, "complex systems fail in unpredictable way." Complex systems will fail but one way to ameliorate risk might be to take a herd immunity approach. In immunology, if one inoculates a large part of the population, those who are not inoculated benefit from herd immunity. In some areas, this approach might work. However, it is not clear it will work in today's era where an individual might work for a company during the day, but is a private person at night. Threats may seep in from one part of a person's life to another.

Companies try to immunize themselves by sharing threat information and identifying trends. They assess how real the risk is to calibrate their risk meters. Companies also operate emergency response teams. Mozilla pays researchers and hackers to tell them about vulnerabilities in their systems. Others incentivize third parties to report bugs. Microsoft offers $200,000 to anyone who can build the next best defensive technology. However, at some point, it is up to the consumers to demand better products to lower their risk profile.

Another way companies try to immunize themselves is to bring civil legal suits against hackers in increasingly untraditional ways. Facebook pioneered this technique. In 2008, they won $873 million in judgments for spam. In one case, Facebook won a $711 million

case against a Canadian citizen. While he thought he could avoid prosecution by staying in Canada, Facebook worked to extend the judgment in Canadian courts. While suing these individuals will never result in recuperating fines, it becomes a deterrent as countries work together to pursue these criminals. Microsoft also took a civil, legal approach to prosecuting botnet herders. In March 2012, they used organized crime laws to go after botnet servers.

Governments' role is to set international norms of behavior. They try to set a level playing field. For example, when the USG came out with cyberspace laws, the rest of the world followed. However, governments differ in law creation. In the U.S., the laws' focus on cybercrime. In Russia and China, the laws also focus on information security to protect their social fabric. The different ways countries define cyber security can make it difficult to coordinate, but countries should start by focusing on "double illegal" areas – these are certain things that everyone agrees are bad – child abuse, spam, botnets[9], TCOs, etc. Anything that diminishes the power of the state is bad. Countries should start working on these issues first to build trust and confidence before tackling larger issues.

Governments can also use legislation to create normative behaviors. If everyone is clear what a breach is, everyone can work together to calibrate the sensor, but there are no uniform information security laws. Industry thought that normative behaviors would be generated when consumers demanded "good" products, but this did not happen. Most individuals have no power to demand change other than reporting websites to the Better Business Bureau. Tech savvy individuals may have slightly more power in that they can band together to report bugs and join communities to help create standards and to report breaches. Then people, through insurance companies, would demand better laws, but there are no actuary tables for these kinds of breaches. That leaves legislation as the only tool available to address breaches. Ironically, this is one area where no one wants legislation, but it is the only body able to effect change.

Invited Speaker: LtGen Robert E. Schmidle Jr., Deputy Commandant for Aviation, USMC

LtGen Robert Schmidle Jr.'s command assignments include: Commanding General of First Marine Aircraft Wing, Commanding Officer of Special Purpose Marine Air-Ground Task Force (Experimental), and Commanding Officer of Marine Fighter/Attack Squadrons 251 and 115. Previous operational assignments include multiple tours flying the F-4 and F/A-18 aircraft as well as serving as the operations officer and air officer of an Infantry Battalion, First Battalion 9th Marines. Additionally, Lieutenant General Schmidle has served in the following key staff assignments: Deputy Commander for U.S. Cyber Command, Assistant Deputy Commandant of

[9] A botnet is a collection of computers, connected to the Internet, whose control has been breached and controlled by a malicious party.

the Marine Corps for Programs and Resources (Programs), Deputy Chief of Staff for Integrated Product Team 1 for the 2006 Quadrennial Defense Review and USMC lead for the 2010 Quadrennial Defense Review, Deputy Director for Resources and Acquisition in the Joint Staff J-8, Director of the USMC Expeditionary Force Development Center and the Military Secretary for the 32nd and 33rd Commandants of the Marine Corps.

LtGen Schmidle presented a talk on "Psychological and Social Theories in Radicalization and Terrorist Networks."[10] LTGen Schmidle studied radicalization and the psychology of terrorism. He related what he learned about radicalization to social theories in use today. He broke his talk down into three components: 1) social theory grounds us in context, 2) social theory can help us understand why individuals radicalize, and 3) technology, science, and social theories can be combined to increase understanding.

Any discussion of the psychology of radicalization begins with one's sense of self. Research in the 1950s looked at deviant groups such as motorcycle gangs. Researchers discovered that people undertake the same steps when joining any kind of organization. Society is the one that determines whether a group is deviant or not. Group identity develops in the same manner regardless of whether the group is labeled deviant or not.

There is a sense of relativity associated with the notion of rationality. When we say some group is rational, we are assigning value to that organization. Some see a Marine's willingness to get up at 0400 for physical training in a driving rainstorm as irrational, Marines do not. Therefore, the notion of rationality is relative.

The discursive approach looks at what people say from the standpoint of their position in the discourse and understand the difference of "I" versus "we" in terms of attribution. This approach helps us to understand the world from another's perspective through the language (s)he is using.

If one decides to belong to a group, (s)he has certain rights and duties assigned to him or her. Additionally, there are accepted modes of behavior that are considered rational in that group in the local cultural context in which that group thrives. Different groups have different norms, duties, and right. This is different from a role. A teacher has a role in a classroom. It is a teacher's duty to convey knowledge, but when a student contributes something profound to the discussion, (s)he positions herself as sharing the same knowledge as the teacher, but the roles of teacher and student stay the same. Similarly, terrorists can change positions as their sense of self develops and evolves.

LtGen Schmidle argued that a more complete understanding of why someone becomes a terrorist is gained not by studying the individual, but by studying the social context and human networks in which an individual lives. Convictions that sustain a network are moral

[10] See also Robert Schmidle (30 October 2009) Positioning Theory and Terrorist Networks, *Journal for the Theory of Social Behavior*, 40(1) pp. 65-78.

not economical or biological. Moral considerations determine why people behave in a particular way.

A radical Islamist looks at Western society, determines that it is responsible for evil, and therefore assumes the right and duty to destroy that society. When that happens the terrorist positions society as being devoid of value, which rationalizes the terrorist taking violent action.

The concept of apprenticeship and human development may apply here. Without direction, a child will not develop or acquire new skills. The mentor helps the individual learn how to behave. Every function in a child's development appears twice: first learned with others and then internalized. You see this development in other organization. Individuals leave boot camps as Marines, but the transformation came about because mentors showed them how to be Marines. And now that the individual is a Marine, he or she has rights and duties as members of that group. This shows the symbiosis between collective and individual self.

The foundation of development comes from unexamined beliefs informed by positions one takes. A hinge is a fundamental practice in the form of life one choses to live. Hinges do not come from reasoning or experience, but from living in a particular moral order. For example, when one unconsciously moves out of the path of a black cat, hinge beliefs are responsible. These unexamined beliefs must be identified and understood in order to understand what drives the behavior of others.

Jihadists groups have a hinge belief that the West is a morally deprived entity. It is something they believe without having to consciously reason. Many times, those in the West believe that conflict can always be resolved, but there will always be tension and some things will never be resolved. The USG will never be able to resolve the radicalization problem; it is simply part of the battlespace.

Terrorism is a cultural practice. To those participating in it, terrorism is a meaningful and rational activity. Some argue that one man's freedom fighter is another man's terrorist; it is dependent on one's perspective.

Nobody is born a terrorist, but people become terrorists the same way a person joins any group. In every closed institution is a process one goes through to belong. The process to become a terrorist can be thought of as a staircase. The terrorist begins life on the ground floor like everyone else. As one travels up the staircase, the number of doors becomes increasingly limited until there is only one door that leads to the destruction of others or oneself. Additionally, as one advances, it seems increasingly irrational to do anything else. The more one ingratiates oneself into a culture, the more difficult it is to leave. As one's sense of self deepens, it becomes increasingly difficult to see oneself doing something else.

The Internet is a means of communication. It enables the discursive development of self. Marc Sageman argues that chatrooms accelerated the process of radicalization. When one is dealing with electronic communication, one is creating a self in a micro world. This allows increasing radicalization as people feel freer to engage in behavior online that they would not do in the physical world. An increasing number of women are drawn into terrorism because the Internet offers anonymity that allows them to participate.

A person's decision to become a terrorist is a moral decision. . We must look at the problem holistically. Despite the West's hinge belief that conflict can always be resolved, the new normal is that the West will have to deal with the fact that terrorism is not going away.

Discussion

It seems the way to move forward is to gain insight from terrorism by harvesting the technology we have at hand and use an adaptive approach.

LtGen Schmidle responded that technology could help us determine what influences the behavior of an individual and determine how that individual is embedded in an organization. He argued that this process may help us discover where unexamined beliefs come from. He noted that there needs to be an approach that helps us understand the interaction between the group and the individual to better understand how to influence people away from radicalization.

The idea of relating language to development of one's self on the Internet is fascinating. Is there something unique about language used on the Internet versus spoken language? There is a younger generation that uses chatrooms. Do they feel disconnected from their culture if they cannot use these communication techniques?

LtGen Schmidle thought it likely that some individuals do feel isolated without online forms of communication. It is important to understand that language gets meaning from use. Chatrooms create a microcosm—that is what attracts people. Individual can be someone else within these realms.

Can the Internet be used to decrease a person's loyalty to more traditional institutions, like the state?

LtGen Schmidle responded that this does not seem to be occurring, especially when considering the re-emergence of nationalism in Europe, evident in the responses of individual countries in the European Union to their own and other countries economic problems

It seems that adults go through stages of development from "what's in it for me?" to the unified mind. The ladder you described in your presentation seems to represent this transition from the individual to the group. The Internet is forcing the development not only of terrorism but of the global mind to take into consideration other perspectives. How can the Internet be used to influence these individuals to take into account other perspectives?

LtGen Schmidle stated that if an individual believes that everything they read on a website is true, then the information presented informs one's beliefs, practices, and development. It is possible to influence this person discursively. The Internet gives one greater exposure to a target population.

Panel Six-Insights from Neurobiology on Influence and Extremism

The panel "Insights from Neurobiology on Influence and Extremism: Specific Insights" will focus on presenting multi-disciplinary, cutting-edge research insights for the operational community. The panel will focus on discussing topics pertinent to understanding how advances in neurobiological sciences combined with an understanding of environmental influences can augment our efforts to counter-influence campaigns, stymie efforts of extremist organizations, and improve target audience identification and understanding. Panelists will draw from their research within the fields of social cognitive neuroscience, genomics, and applied social psychology to address the question, how can my research improve current DoD efforts, specifically what can research add to provide enhanced and refined target audience analysis and diminished risk for unintended consequences?

Panel Members:

- Mrs. Abigail Desjardins, NSI, Moderator
- Dr. Diane DiEuliis, HHS, Moderator
- Dr. Jim Giordano, Georgetown Medical Center
- Dr. Pete Hatemi, Penn State University

Mrs. Abigail Desjardins, NSI

Abigail Desjardins joined NSI as a Senior Research Scientist in early 2009. In this capacity, she provides innovative, research-driven solutions to the challenges in human, social, and cultural behavioral modeling. Prior to joining NSI she worked for DGI, Inc. where she used findings from neuroscience to augment and refine social psychology findings on issues of concern to the military, intelligence, and national security communities. Prior to DGI, Mrs. Desjardins worked at RAND where she worked on numerous projects for the Intelligence Policy Center.

Mrs. Desjardins welcomed panel participants and noted that the USG can benefit from relationships with the academic community and neurobiology is a good area for engagement. Through marrying neurobiology with other areas of social science, problems affecting the USG can be triangulated and addressed.

Dr. Diane DiEuliis, HHS

Diane DiEuliis, Ph.D. is the Deputy Director for Policy in the Office of the Assistant Secretary for Preparedness and Response (ASPR), U.S. Department of Health and Human Services, a position she has held since August, 2011. She is responsible for the coordination of policy and strategic

planning for all components of the Office of the ASPR to support domestic and international public health emergency preparedness and response activities.

Dr. DiEuliis stated that the current challenges are connecting the dots between what has been learned about the hardwiring in brains and human behavior, and what this means for operations.

Dr. James Giordano, Georgetown Medical Center & PIPS

James Giordano PhD, is Professor of Integrative Physiology in the Department of Biochemistry, and Chief of the Neuroethics Studies Program in the Center for Clinical Bioethics, at Georgetown University Medical Center, Washington, DC, USA. He is Director of the Center for Neurotechnology Studies, and Senior Fellow and Regent of the Potomac Institute for Policy Studies, Arlington, VA, USA, was 2011-2012 Fulbright Professor of Neuroscience, Neurotechnology, and Ethics, and currently is Section Head of the Neurotechnology and Neuroethics Across Generations (NNAG) Program at the Human Science Center of Ludwig-Maximilians Universität, Munich, Germany. As well, he is IGERT Research Professor of Neurosciences and Ethics in the Department of Electrical and Computer Engineering at the University of New Mexico, Albuquerque, NM, USA, and William H. and Ruth Crane Schaefer Distinguished Visiting Professor of Neuroethics at Gallaudet University, Washington, DC.

Dr. Giordano presented a briefing on neuroscience and neurotechnology, addressing the capabilities, limits, validity, and value in predicting individual and group cognition, emotions, and behavior. The brain is an opportunistic target for multiple level evaluations and interventions that may enable better definition, and manipulation, of particular neurobiological substrates that are influenced by, and influence individual and group beliefs, intentions, and patterns of psycho-social activities.

Such use of neuroscience, and neurotechnology employs an assess, access, and target (AAT) model. This approach engages the combined use of a number of neuroscientific and neurotechnological methods, including, but not limited to various forms of neuroimaging (e.g.- functional magnetic resonance Imaging (fMRI), single photon emission computerized tomography (SPECT), magnetoencephalography (MEG)) and neurogenomics and neurogenetics. However, despite almost ubiquitous flaunting of neuroimaging studies in public media, the actual capabilities and limitations of these techniques and technologies remain a constraint in their operational and field use. For example, neurioimaging is susceptible to experimenter-induced signal vs. noise biasing. Additionally, the size of current neuroimaging hardware makes it difficult to use outside of laboratory conditions. Neurogenomics and genetics, while descriptive to some extent, are bounded in predictive capability by vagaries of multiple-gene effects, and environmental alteration of genotype-to-phenotype penetrance. That is, while each of these neuroscientific techniques and technologies possess certain strengths, they also have specific inadequacies, and these define and constrain their operational and field use and utility. Meaningful and more genuine operational utility can only be achieved when multiple fields, methods and techniques are systematically and purposively conjoined to focus upon mechanistic

understanding of neural events that contribute to or evoke cognitions, emotions and behaviors.

Advanced integrative scientific convergence (AISC) brings together genomics, genetics, neuroanatomic and neurophysiologic imaging studies, chemical biomarker assays, computational science and technology, and analyses of behavioral and social dynamics to engage diverse tool and method sets. In the main, the use of AISC within the AAT approach enables assemblage, synthesis and analyses of large and diverse types and levels of data to define, and depict complex dynamic neurobio-psychosocial patterns of individual, group and cohort cognitions, emotions and behaviors. In this way, multiple disciplines can be focused upon neuroscientific questions that are important to developing insights and interventions to prevent and mitigate certain forms of aggression, hostility and social violence, which are axiomatic to neurodeterrence.

Of equal concern however, are the vulnerabilities that this approach may incur. AISC necessitates the use of multiple types and tiers of data, amassed through yoking, assimilating and integrating hierarchical domains and levels of information that can be used comparatively, normatively and predictively. While relative security may be maintained within certain domains, the "stacked" nature of these tiered data fields and systems may be susceptible to hacking. As well, given that interventive approaches are also dependent, at least in part, upon cybertechnology for development and delivery, this AISC-AAT model of neurodeterrence is critically reliant upon cybersecurity measures for both its development and sustained utility and effectiveness.

The use of neuroscience and neurotechnology to identify brain structures and activities correlated to reported cognitive and emotional states give rise to a number of ethico-legal questions. Some of these questions are listed below.

- Does the linking of brain states to cognition, emotions, or behaviors imply – or explicate – some form of "mind reading"? Can neuroscience and neurotechnology be used to predict cognitions, emotions, and behaviors?
- How will various groups within societies use, misuse or frankly abuse the capabilities of neuroscience and neurotechnology to determine intent, capability, or culpability? And, how could – or should - such determinations and predictions be employed when attempting to prevent or mitigate the cognitions, emotions and/or actions of individuals or groups?

There is a fine line between gathering information and infringing upon an individual's rights, and these parameters, prescriptions and proscriptions need to be explored and defined. For example, if patterns of neuro-cognitive mechanisms and activity are deemed to be normal or deviant, it becomes important to ask, "What is normal?" Cultural differences of biology, psychology and socio-anthropology must be taken into account when attempting to address and answer such questions. Indeed, neuroscience and neurotechnology offer

considerable promise and potential to define, interpret, and predict human cognition and behavior. It is important not to fall victim to false hubris about the capabilities of neuroscience, nor exercise equally false hubris about resisting temptation and exercising restraint against using new science and technology in ways that are inapt.

In order to establish a sense of pragmatism and prudence in the development and application of neuroscience and neurotechnology in operational settings, the following groundwork questions must be asked:

1. What are capabilities, limitations, and risks?
2. What are unique technical, ethical, legal, and social issues?
3. What de-limiting, risk-analyses and implementation parameters can be used?
4. Do (novel) situations militate which analyses and approaches should be used?

Incorporating neuroscience and neurotechnology to the toolbox of operators will require a phased approach so as to ensure this sense of pragmatism and prudence. Toward such ends, the following paradigm is proposed when researching, testing and evaluating new, and novel applications of existing neuroscience and neurotechnology:

1. Deep dive depiction and analysis of utility of extant neuroscience and neurotechnology capabilities that could be operational within 12-18 months.
2. Analyses of new neuroscientific and neurotechnological capabilities, and formulation of a road map for future neuroscience and neurotechnology research and development viable for first phase operational translation within 18-36 months.
3. Combination of extant and new neuroscience and neurotechnology research and development outcomes and products' analysis and T/E phase trials' design and implementation in 36 to 48 months.
4. Incorporation of new/novel neuroscience and neurotechnology for field use within 36 to 48 months.

Dr. Pete Hatemi, PSU

Dr. Pete Hatemi is a research fellow at the United States Studies Centre at the University of Sydney and Associate Professor of Political Science, Microbiology and Biochemistry at The Pennsylvania State University. He was trained in political science at the University of Nebraska, and in genetic epidemiology at the Queensland Institute of Medical Research (QIMR). He continued his post-doctoral study in Human Genetics, Psychology, and Psychiatry at the Virginia Institute for Psychiatric and Behavioral Genetics (VIPBG) in the Medical College of Virginia. He is primarily interested in advancing the study of the neurobiological mechanisms of social and political behaviors and utilizing advanced methods in genetics, physiology, endocrinology, and neurology in order to better understand human decision making and preferences in complex and dynamic political environments. He also an active member of the Institut for Statskundskab at Syddansk Universitet, VIPBG and the genetic epidemiology lab at QIMR.

Dr. Hatemi presented his research on the potential use of genetic and neurobiological information to understand and manipulate the behavior of violent actors. In terms of technology, the U.S. has been beaten at their own game. A 14-minute trailer for The Innocence of Muslims, a movie that satirizes Muhammad, was posted on YouTube and then picked up by Arab news media. Demonstrators stormed the U.S. embassies in Cairo and Benghazi. This was a planned attack, but the video was used as a diversion. This is an example of the use of emotions to provide political and physical cover for terrorism.

Neurobiologists are investigating whether there are tactics that can change the target of an attack or diffuse emotions. This would include understanding how certain cognitive and emotive states are manipulated, including hormonal pathways, emotional states, and long-term memory, to develop targeted intervention, manipulation, and diffusion strategies. Through the study of the interaction of brain structure and function, genetic factors, and social, individual, economic, and environmental factors, insight to an individual's aggression is gained.

Through study, it has been found that depending on the order that hormones are released, a situation can be created in which subjects become violent. A group of individuals with strong feelings of patriotism was identified. The first stimulus was exposure to a real video of Ambassador Stevens being dragged out of the embassy by cheering Libyans. The first control group was exposed to a video of the Libyan civil war and the second group was shown either nothing, Fox News blaming Hillary Clinton, or Susan Rice saying it was not a terrorist attack. Blame, anger, and aggression were measured. Results suggest that aggression cannot be turned off but blame can be shifted. In particular the Hillary Clinton stimulus correlated with the highest level of dopamine and the lowest level of serotonin. Through increased study of hormonal regulation the most potent manipulations can be discovered which can be used as preventative and directional insights for the operational community.

The current U.S. strategy of democracy promotion ignores the role of neurobiology. This policy relies upon incorrect assumptions, including that all people want to live in a liberal democracy and even if they do not their attitudes will change once living under a liberal democracy. However, when liberal values are forced onto a population they become outraged. An alternative approach is engagement through economic development or living side-by-side with those of different values.

Discussion

This was a fascinating presentation of nature versus nurture. It seems like Dr. Hatemi is incorporating more social context into his work, which there should be more of. The field has gone very far out on a limb using Neuroscience to predict behavior. Dr. Hatemi, concerning your work on democracy and hormones, why is this an issue of public diplomacy?

Dr. Hatemi responded that nature and nurture are interactive. For example, one can put gas in a car but you need to know where you are going, and how to get there. Just like an individual cannot be separated from their cultural values and they must be respected.

Dr. Giordano, how does context figure into the neurological model?

Dr. Giordano explained that the model joins social science and humanities. There is reciprocity between these. The goal is to add neuroscience to the toolbox of problem solving and increase the understanding of bottom up and top down approaches to add value to operations.

How do you work with the people in qualitative field? The research tradition is useful, how do you use this in your work?

Dr. Giordano stated that more integrative neuroscience and social cognition are, including a greater reliance upon mixed methods and the idea of using quantitative and qualitative methods, the better it is for research.

Dr. Hatemi explained that his team conducts qualitative interviews before survey questions are formulated, and then blood and saliva is collected. Once instruments are built quantitative methods are used. Sometimes this process is reversed but only when a particular point keeps coming up. We then ask, "What can we do about this?"

Work recently has been motivated by the acute problems of the last 10 years and largely focused on short-term interests and understanding population attitudes. Now that troops are being drawn out, can we talk to a multi-generational goal of modifying attitudes of the world to align with our goals?

Dr. Hatemi stated that the neuroscience community knows how to manipulate people in the short term, and what activities should not be done to avoid the worst reactions. There have only been a few theoretical papers on long-term change as passive engagement. When values are forced on a population, they fight back. However, through giving societies the tools that align with our goals, they tend to move in that direction independently.

Dr. Giordano noted that through understanding the ways in which neuroscience play into various frameworks, better insights might be gathered rather than just getting along as we are now.

Is there greater benefit to promoting mechanisms of positive change rather than discovering what makes people mad?

Dr. Giordano stated that there are some fields that we have tried to hinge upon the notion of more utopian aspects while utilizing science and technologies to derive an approach to neuroethics. In reality, it may be that the most negative outcomes are avoided and try to extrapolate substrates that are used to mitigate negative behavior and stay left of the boom.

Dr. Cabayan added, from SMA perspective, there is significant value added to understanding how neuroscience influences radicalization and mobilization of VEOs. The goal is to get better at what integrating different academic perspectives to inform human behavior for operations planning.

Dr. DiEuliis agreed and added that this is a process of how neuroscience is layered into the toolboxes.

Panel Seven: Insights from Neurobiology on Influence and Extremism: Operational Perspectives

The panel "Insights from Neurobiology on Influence and Extremism: Operational Perspective" will discuss how new insights from both neuroscience and network sciences are likely to change the way the military conducts operations, to include influence operations, intelligence analysis, psychological and military information support operations, and cyber activities. The panel will also discuss emerging trends, technologies, and analytical approaches, which will impact the way the military plans and operates. Key topics will include:

1. What are the specific implications of these new findings, and the new information environment, on MISO operations and strategic communications?
2. How do we deal with the technical challenges of establishing "identity" in the cyber domain? Specifically:
    a. Should MISO personnel reveal their US "identity" before, during, or not at all during online engagements?
    b. How should MISO personnel reveal their "identity" and whether that revelation will have positive or negative effects on the individual's radicalization pathway?
3. In the next twenty years, how do we think that emerging technologies will affect the dynamics of extremism, and what social realities are likely to remain relatively constant even as emerging technologies continue to change our patterns of social interaction? How do these potential technological advances provide the US opportunities to both counter and deter?

Panel Members:

- Col Marty Reynolds (JS, J3, DDGO), co-moderator
- Col William Young (MIT), co-moderator
- Dr. Bill Casebeer (DARPA)
- Mr. Jason Spitaletta (APL)
- COL Tom Evans (JS J39 MISO)
- COL Matt Venhaus (OSD SOLIC)

- Dr. Panayotis Yannakogeorgos (AFRI)

Col Marty Reynolds, JS, J3, DDGO, welcomed the panelists and spoke about emerging trends in the information environment. First, cyberspace is becoming increasingly complex and is expanding at an incredible rate. It is not just the number of devices in use, but also the speed at which information is uploaded. The field is generating new jobs, which did not even exist ten years ago. Information technology has become so pervasive that some suggest the first indicators of conflict would come from cyber/social media. Wireless devices are becoming more portable and application driven. These devices increasingly rely on the commercial sector. In fact, some developing countries are bypassing landlines and going right to cellular networks.

Col Reynolds stated that it is difficult to predict where the information revolution is going. Advances in related fields like quantum computing could have significant ramifications. Additionally, tools enabled by information technology, such as the availability of online classes could radically change the number of people who have access to high quality, low-cost education on a massive scale.

Mr. Jason Spitaletta, JHU/APL

Jason Spitaletta is a Major in the US Marine Corps Reserve currently assigned to the Joint Staff J7 Deputy Director for Joint and Coalition Warfighting as an Observer/Trainer. Prior to that he was assigned to 4th Air Naval Gunfire Liaison Company (ANGLICO) where he deployed in support of Operation Iraqi Freedom. In civilian life, he is a researcher at The Johns Hopkins University-Applied Physics Laboratory. He holds a bachelors' degree in biochemistry from Franklin & Marshall College, masters degrees in human factors from Embry-Riddle Aeronautical University and applied experimental psychology from Catholic University, where he is currently a doctoral candidate. He also holds a graduate certificate from Stanford University's Summer Institute for Political Psychology.

Mr. Spitaletta stated that one question used frequently by the SMA community is "so what?" How can research be operationalized? The Military Information Support Operations (MISO) field can benefit from a greater understanding of neuroscience. Neuroscience can be applied to MISO in three ways. It is important to note that it should be done at the individual level of analysis, not the group level.

- Target audience analysis: the systematic examination of relevant social and psychological factors of a specified group of people that may be effective in accomplishing a particular mission.. It seeks to identify underlying issues and susceptibilities. This analysis can be informed by identifying neural correlates of specific vulnerabilities and susceptibilities, for example the difference between anger and disgust. These triggers provide operators with decision points, requirements, and MOEs. While the basic science has been done, a more targeted approach is needed to make output useful to the MISO community.

- Product and series development: products are increasingly disseminated via cyber based communication technologies (CBCT). These products are informed by persuasive technologies, which incorporate some elements of psychology. These kinds of tools can help provide a rich contextual understanding (RCU).
- MOEs: Measuring the effect of psychological operations/PSYOP (Now MISO) is very difficult. The development of MOEs in laboratory settings may help the operator construct valid MOEs in the planning process.

The USG may be able to leverage neuroscience as an asymmetric advantage over the adversary.

Dr. Panayotis Yannakogeorgos, AFRI

Dr. Panayotis "Pano" A. Yannakogeorgos is a Research Professor of Cyber Policy and Global Affairs at the Air Force Research Institute. His expertise includes the intersection of cyberspace, national security and military operations, cyber international relations, cyber arms control, violent non-state actors and the Eastern Mediterranean. He has recently authored articles chapters including: "Internet Governance and National Security" (Strategic Studies Quarterly) "Challenges in Monitoring Cyber Arms Control (Journal of Information Warfare and Terrorism), "Pitfalls of the Private-Public Partnership Model" in Crime and Terrorism Risk: Studies in Criminology and Criminal Justice (Routledge) and "Cyberspace: The New Frontier and the Same Old Multilateralism" in Global Norms: American Sponsorship and the Emerging Pattern of World Politics (Palgrave). He has also published in The Atlantic, The National Interest, and The Diplomat. Prior to his current position, Dr. Yannakogeorgos taught graduate level courses on globalization, security and intelligence at Rutgers University's Division of Global Affairs, where he also served as Senior Program Coordinator, and led the Center for the Study of Emergent Threats in the 21st Century. He has participated in the work of global cybersecurity bodies including the High Level Experts Group of the Global Cybersecurity Agenda of the International Telecommunications Union. In 2006 he served as an Adviser within the United Nations Security Council on issues related to nuclear non-proliferation, the Middle East (including Iran), Al-Qaida and Internet misuse. He holds a Ph.D. and M.S. in Global Affairs from Rutgers University, and an ALB in Philosophy from Harvard University.

Dr. Yannakogeorgos stated that looking ahead 20 years, he expects that the core technologies we use now will be shifting gears. Currently, users are working on Internet Provider (IP) version 4, but version 6 will allow users to have accurate online attribution. There will be increased voice over capabilities as well. Mobility will also greatly increase. 3G and 4G technology will greatly empower individuals to have access to broadband Internet connection over the wireless network. IP version 6 will be more energy efficient so batteries will last longer.

In the near future, there will be numerous changes to the Internet, all of which will challenge the USG's ability to effectively operate. In 20 years, there will also be a fundamental change in the domain name system. Instead of generic top-level domains (.com, .net, etc.), many groups will be able to control a domain (e.g., jihad). Furthermore, right now computer codes are written in English or Arabic script. Before long, non-English, non-Arabic script will be used. The USG already has a language barrier problem and this will exacerbate it. Users will also begin shifting to alternative domains, which are not accessible to the regular Internet (called onion networks). The USG will lose access and insight into illicit activity.

However, general social realities will remain the same.

It will be increasingly difficult to use information technologies to influence transnational actors. China and other nations will continue to run an intranet separate from the global Internet. When using Internet tools to shape or attack, it is hard to reach targets within a country's intranet. Iran, China, and Russia are heading down this path.

The role of the Internet and information sharing will continue to be a pressing issue for the USG. The radicals of 2032 are 10 years old right now. They are feeding off digital information. The USG must better understand how they are thinking if they are in the cyber space right now. Urban youth are more likely to have access to mobile technologies. Parts of the world in 20 years still will not have access to digital technology, so there will be generational shifts. As more people join the Internet, more radical influences can be used upon them. The information environment will empower many kinds of groups to compete with governments, whether for social mobilization calling for reform or for jihadi groups to better recruit online. Additionally, there could international economic consequences if rumors are started online about the failure of stocks on Wall Street.

Within MISO, there are several operational applications. One is persona management. There is great potential to craft messages online. The problem is that the USG does not like to lie, so attribution becomes a problem.

The biggest problem facing the MISO community is that USG operators need to be culturally and linguistically able online. It is not enough to use machine translation. The government needs to invest in cultural immersion programs. It needs to make sure its messages are properly attuned to the target audience.

Dr. Bill Casebeer, DARPA

Dr. Casebeer is a Program Manager in the Defense Sciences Office at the Defense Advanced Research Projects Agency (DARPA). His research interests include neuroethics, the evolution of morality, the intersections of cognitive science and national security policy, philosophy of mind and military ethics (such as the ethics of torture interrogation). He is author of "Natural Ethical Facts: Evolution, Connectionism, and Moral Cognition" (MIT Press), co-author of "Warlords Rising: Confronting Violent Non-State Actors" (Lexington Books), and has published on topics ranging from the morality of torture interrogation to the rhetoric of evil in

international relations, in venues such as Nature Reviews Neuroscience, Biology and Philosophy, and International Studies. He is a reviewer for multiple academic presses and journals and has conducted numerous refereed conference presentations.

Dr. Casebeer stated that science has shown that influence is context dependent. This should not be a surprise because the brain is an organ of influence. The brain mediates information and action. Many things exert influence on the brain. Biologists discuss this in terms of the 4 F's: feeding, fight, flight, and fornication. Dr. Casebeer suggested two more F's: friendship and forecasting. The brain is a social organ, providing many opportunities for influence. The brain is also a predictive organ, making predictions about rewards in a particular environment.

There are all kinds of causes of action that are not intuitive. One can induce another to perform an altruistic action if provided with a reward. Dopamine might bias someone to be more sensitive to the needs of those around them.

Social structure and networks drive behavior. Context-dependent influence operations will allow the USG to broaden its toolset, particularly over the Internet. Peer pressure continues to impact decisions and the context of the specific person one is interacting with is important. Researchers have shown that narratives have the ability affect social contact and empathy networks in the brain. It is possible to quantify how empathetic mechanisms influence behavior.

Research is also underway to quantify social networks. Sociometers at MIT labs are trying to do this. Humans are constantly giving off signals of emotion—for example, how one orients their body in relation to others. Measuring these things can help bring hard science to social interactions. An important element in these social networks is an individual's credibility. Ethos is an important element when determining questions of online attribution. Ethos is starting to be tested using quantitative neurological mechanism.

Neuroscience can help MISO and IO operations learn about how to set environmental conditions that lead to successful interactions, as well as helping to construct the message itself. Although the individual is the best level of analysis, the best way of thinking how to influence an individual is to think about how to influence the system—for example, eye contact or hormone production.

The neuroscience community is finally in a position to scientifically confront what previously has been considered qualitative. It will attempt to build sensors capable of measuring influence.

COL Tom Evans, JS J39 MISO

Colonel Thomas H. Evans is currently the Division Chief for the Joint Staff Military Information Support Operations (MISO) Division, located within the Deputy Director for Global Operations,

Operations Directorate in the Pentagon, Washington, D.C. He is senior advisor to the Chairman of the Joint Chiefs of Staff on worldwide MISO activities. His military assignments include Psychological Operations (PSYOP) Battalion Commander in Ft Bragg, NC, Chief of Information Operations at U.S. Southern Command in Miami, FL, Commander of the Joint Psychological Operations Task Force in Camp As Sayliyah, Qatar, and most recently Chief, Information Operations at U.S. Army Europe HQ in Heidelberg, Germany. COL Evans possesses the Ranger and Special Forces Tabs and is a graduate of the Brazilian Command and General Staff College. He also holds a degree of Master of Science in International Relations from Troy State University and a Masters of Arts in National Security and Strategic Studies from the U.S. Naval War College.

COL Evans focused his brief on emerging trends and how they affect PSYOPS, which is now known as IO. It seeks to influence activities to change the behavior of adversaries or friendly foreign audiences to support military operations. IO used to be conducted primarily through print media, loudspeakers, radio, TV, and face-to-face interactions, but now is primarily digital media. The objective is still the same, but the toolset has changed.

IO is both an art and a science. Its goal is to get the right leaflet with the right message distributed at the right time. Trying to get messages synched with commander objectives is difficult, but important.

One way the information environment is changing IO is that it is now a two-way street. Previously, leaflets were dropped or radio messages were broadcasted and that was the end. However, with the advent of social media, the audience can respond to the messages. IO needs to be prepared to respond back. IO now has digital engagement teams to conduct these kinds of conversations.

These interactions have opened a new box of challenges and opportunities. Previously IO relied on civilian analysts and cultural experts to help create messages. Now IO is increasingly relying on behavioral scientists. It is unclear what impact this will have long-term.

There is some doctrine covering assessment. Over the last few years, there has been more emphasis on assessing influence, but it is not clear whether influence can be measured.

COL Matt Venhaus, OSD SOLIC

COL Venhaus has spent most of his 24 years in the Army in the field of foreign media influence operations. A 1987 graduate of the United States Military Academy at West Point, COL Venhaus has served in a variety of command and staff positions. He was the Chief of Radio and Television production and dissemination for NATO Stabilization Forces in Bosnia. Later, he was the Operations Officer for the Joint Psychological Operations Task Force during Operation ALLIED FORCE (the Kosovo Air Campaign). He served as the Information Operations Chief of Targeting and Assessment in Afghanistan during the early stages of Operation ENDURING FREEDOM. After returning from Afghanistan, he served as a Senior Human Factors Analyst with the Defense Intelligence Agency. During his most recent operational deployment, he was

the Commander of the Joint Psychological Operations Task Force responsible for the conduct of PSYOP throughout the US Central Command's Area of Responsibility with forces operating in over 11 countries.

COL Matt Venhaus, OSD SOLIC, stated that SMA was originally created to bring operators together with academics. SMA brought academic rigor to the process. COL Venhaus noted that a lot of effort has been focused on radicalization, but there is relatively little on deradicalization. They are not polar opposites. Radicalization is not a staircase where you can only go up and never step back down. Individuals can deradicalize in many ways and this process is understudied. This kind of deterministic belief in radicalization results in two faulty assumptions: 1) the only thing one can do is prevent radicalization in the first place and 2) one can only go after the root causes of the problem. Neither of these approaches gets people to step back from radicalization.

The issue of online attribution is important. In the physical realm, one must declare one's allegiance. In the online realm, one's identity is fungible. Science has advanced to the point where it can help inform when to disclose online identity and when not to. However, this area deserves a tremendous amount of further study.

Technological advances make it possible to conduct constant monitoring to see whether a product is effective. It is an iterative process of activity and analysis. If influence can be measured online, then one can measure change, which has not been done before. First we have to understand how online behavior is different from physical behaviors.

In order to use influence effectively, operators must first penetrate a denied audience on the Internet. Just having a computer does not make one a cyber operator and just having Internet does not make one a cyber operative.

Discussion

Do you think factors influencing deradicalization are the same ones that influence radicalization? Is the timeline similar?

COL Venhaus responded that he did not believe the factors that contribute to radicalization are parallel to those that contribute to deradicalization. It is not an iterative process. It takes more time to radicalize than to deradicalize. In addition, deradicalization requires that an alternative to the path be available. If the answer is to put explosives in ones underpants, what is the question? The USG needs to construct a meaningful alternative.

Mr. Spitaletta stated that it is important to distinguish demobilization from deradicalization. An individual can maintain an ideology but no longer participate in violence. The trick is not to divorce ideology from identity, but to get an individual away from a position where they support kinetic action.

There is often cognitive dissonance in those deradicalized. It is not clear what causes some individuals to stay rather than leave. Disengagement might be more effective with incentives.

Dr. Casebeer responded that the neuroscience community is not in a good scientific position to provide good theories on radicalization and deradicalization. However, these are empirical questions that could be tested. Some small percentage of extremists are in the group because it is in their biochemical make-up to use violence to resolve disputes. Whether one chooses to use violence depends upon how the individual sees the target group and the language used to frame the problem.

Can you provide any examples of a successfully deradicalized group?

Dr. Casebeer suggested that there is no good answer, but one could look at the PLA's transition to the PNA. Black September is another example where individuals were deradicalized by giving them other responsibilities—a job, a family, etc.

One participant suggested the one could look at the American Revolution as an example. Americans took up arms and then demobilized, which has been woven in the fabric of the country and held as a sacred value. If groups are incorporated into society, then deradicalization can occur. Grievances must first be addressed though.

Col William Young, MIT, suggested that neuroscience looks promising and will pay dividends, but there is still much work to do.

Panel Eight: Deep Futures: How to dive deep in the operational environment

This panel will discuss the practicalities of institutionalizing and executing population-centric/futures/socio-cultural analysis. It will seek to capture efforts to codify this type of analysis, as well as make it actionable/executable. While predominately focused at the theater strategic level and down the panel will further survey some of the current methods employed by practitioners throughout the Defense Department to describe mid/long-range (10-30 years) future operational environments and how these assessments are used to inform policy and strategy development and force planning activities. Key topics will include:

1. Who are the end users of these futures assessments/ what activities do they inform/guide?
2. What is necessary to render subject analysis actionable?
3. What is the scale/scope of defense futures assessments: COCOMs, DIA, Services, the Private Sector (if possible)?

Panel Members:

- Mr. Bill Busch, EUCOM, Moderator

- Dr. Chris Rice, TRADOC, Moderator
- Mr. Josh Kerbel, DIA
- Mr. Richard Martin, JS, J7
- Mr. Jesse Fairall, DIA
- RDML Norman Hayes DCNO

Mr. Bill Busch, EUCOM, noted that deep futures analysis attempts to make the future environment less ambiguous. Although this analysis is not always met with great enthusiasm, it is relevant and the insights are actionable.

Mr. Josh Kerbel, DIA

Josh Kerbel is the Senior Intelligence Officer, Analytic Tradecraft at the Defense Intelligence Agency (DIA). As DIA's "Chief Methodologist" he is charged with, among other things, reconfiguring DIA's prevailing analytic mindsets and practices for a highly complex and uncertain future. He also serves as a principal DIA voice on analytic innovation and/or strategic complexity to the broader IC, USG, and wider audiences. Prior to joining DIA, Mr. Kerbel held senior positions in the Office of the Director of National Intelligence (ODNI); on the Navy staff (CNO/N2); in the Central Intelligence Agency (CIA); and with the Office of Naval Intelligence (ONI). His unclassified writings on the intersections of intelligence and complexity have been published in Studies in Intelligence, Parameters, American Diplomacy, Foreign Policy, and other outlets. Mr. Kerbel has degrees from the George Washington University (GWU) and the London School of Economics (LSE), as well as professional certifications from the US Naval War College (NWC) and the Naval Postgraduate School (NPS). More recently, he was a fellow in the Center for International Studies at the Massachusetts Institute of Technology (MIT).

Mr. Kerbel presented a briefing on the transformations necessary in the Intelligence Community (IC) if it is to maintain its relevance in the increasingly complex, ever changing world. The IC is on the verge of irrelevance if transformative changes are not made. Fundamentally, the IC's existing business model needs to be overhauled. Currently, that model is built around the *collection* of secrets. Such a model made sense for an issue like the USSR: a closed, hierarchical system where the fundamental challenge was a dearth of good information. Faced with such a challenge, a "secret collection model" was a very effective approach to intelligence. However, in today's much more complex—open and networked—international system, secret collection is no longer sufficient. Indeed, the problem today is not a *lack* of information but a *surplus* of information that needs to be made sense of. In sum, the IC's challenge today is more of a cognitive problem than a collection problem.

To address these new challenges, numerous areas of overlapping innovation are necessary. Cognitive innovation will be necessary to enable analysts to thinking of the world in a non-linear fashion. The IC currently self-selects for mainly critical thinkers, however, greater insight into an increasingly complex world requires the addition of individuals with different skills and perspectives—particularly creative/synthetic thinking skills. Organizational innovation will allow the IC to become flatter and more fluid and meet the

requirement "that demands a network to fight a network." Related is the necessity to make procedural changes that permit analysts to have conversations with policy makers—think of them as clients, not customers—and ask them questions that will challenge the way they think. Methodological innovation will involve more use of "synthetic" tools/techniques—gaming, red-teaming, scenario-development, etc.—that integrate creative processes into the currently predominant evidence-centric techniques. Terminological innovation will require the development and adoption of more organic language that is better suited to the increasingly complex and uncertain strategic environment. (The IC's prevailing metaphors are almost entirely Newtonian/mechanical and as such are ill-suited to describing complex systems.) Technologically, the IC needs to expand its efforts beyond data-management to enhanced cognition tools—especially visualization tools that are crucial to the understanding complexity.

Finally, the single biggest and most influential change the IC needs is to become more open. As already mentioned, whereas in the in the past the IC's value-added was seen as the ability to collect and analyze secrets, in the future it will be the ability to effectively synthesize for decision-makers vast amounts of information into useful knowledge. This will require the IC to develop mechanisms for dealing with and integrating with the outside world much more extensively than its prevailing insularity permits. However, if it fails to do this, the IC's slide toward irrelevance can only continue.

Dr. Chris Rice, TRADOC

Dr. Christopher Rice is the Deputy Director of the Chief of Staff of the Army's Strategic Studies Group (SSG). He has served in the Defense Department and the Intelligence Community in a range of technical leadership roles for seventeen years. Prior to joining the SSG, Dr. Rice served as a Division Head in the US Army Training and Doctrine Command G2 developing long-range assessments of the Operational Environment; he previously served at the National Counterterrorism Center as the Lead Strategic Assessment Officer in the Directorate of Strategic Operational Plans, and with the Joint Warfare Analysis Center in a variety of Senior Scientist and Project Lead roles providing direct support to Combatant Commands.

Dr. Rice presented a briefing on the Strategic Studies Group and future operations planning. He noted that when considering force planning and force generation, planners must ask, "How will warfare look in 10, 15, or 20 years?" Furthermore, "What kinds of investments, weapons, and human capital will be necessary to address this new warfare? "

The Strategic Studies Group, which reports directly to the Chief of the Army, was the organizational response to this question what the future of conflict will look like. The Strategic Studies group works with many different agencies and military branches to incorporate many different perspectives into publications. The Group focuses on future problems, from 2025 and beyond.

The Strategic Studies Group focuses on developing adaptable solutions to likely problems. Strategically, adaptability is necessary in order to quickly shape battlefield policy. War-gaming and simulations inform these likely problems. These allow the Group to explore reactions to potential threats. One area these simulations explore is the methodology of war

games in order to scale up these games to examine across the range of global contingencies, many of which are not employable globally.

Mr. Jesse Fairall, DIA

Jesse Fairall is the senior analyst for long-range futures in the Technology and Long-Range Analysis Office at the Defense Intelligence Agency. In this role he is responsible for the futures tradecraft and production of the unit. Previously at DIA, Jesse has been a senior warning officer in the Joint Staff J2 and a global oil and gas analyst. In this latter role, he was seconded to the National Intelligence Council as a subject matter expert to the National Intelligence Office for Warning. Jesse has also worked as the global corporate security analyst for Royal Dutch Shell where he first gained an appreciation for how the corporate world uses futures analysis and scenario-based planning to its strategic advantage.

Mr. Fairall discussed the importance of futures analysis. This analysis provides strategic advantages to the USG and informs decision-making. There are a handful of groups that do futures analysis including DIA, ONI, Monitor 360, RAND, NYU, and other governments. When the DOD looks to operationalize plans, insights are drawn from these future analyses.

The Global Trends Study and the Joint Strategic Assessment provide actionable insight, with utility to users. What makes these documents, as well at the Chairman's instructions successful is the continued dialog between producers and users of the documents. Changes that are made in these documents are based off feedback from the users. In order to ensure the utility of a futures product these conversations need to continue occurring.

Mr. Richard Martin, JS, J7

Richard Martin is a retired Naval Aviator with 23 years of Naval Service. His aviation career included several tours flying the P-3 Orion, and Commanding Officer of Training Squadron Two. He served on the USS Dwight D. Eisenhower as Navigation Officer. As a Department of Defense Civilian with 9 years of service, he has performed as Deputy, Joint Exercise Group, and Deputy, Joint Doctrine and Education Group at the Joint Warfighting Center, and Chief, Training and Education for the Joint Irregular Warfare Center, United States Joint Forces Command. He is currently serving as the Irregular Warfare Requirements Analyst, Joint Staff J7, Joint and Coalition Warfighting. He has been temporarily assigned as the Civil Intelligence Fusion Concept Quick Reaction Test Director for the Joint Test and Evaluation Joint Program Office.

Mr. Richard Martin, JS, J7, presented a briefing on the Joint Staff's civil intelligence fusion concept Quick Reaction Test, which describes the gathering, fusing, integrating, and disseminating of civil information across command's departments and externally with partners. This process will inform and improve the planning and decision making process within the commander's decision cycle.

The effort focuses on population centric activities, which will become increasingly important as warfare continues to change and non-state actors rise. By focusing efforts on studying populations, there can be a greater understanding of environments. Populations can be separated from the violent extremist organizations. This means that better operations can be planned and executed. However, shifting efforts to study populations rather than traditional enemies will require a culture change in the USG.

A civil information fusion center forms processes that foster a mutually supporting, open environment that enables improved information sharing and an understanding of the environment. The leadership of this center must advocate for across-directorate integration and information sharing, including unclassified information. There are many challenges that inhibit civil information sharing including, a lacks of standardized data architecture and supporting systems.

Mr. Bill Busch, EUCOM

Bill Busch is the Chief, Deep Futures section, Strategy Division, Intelligence Directorate, US European Command (EUCOM). He oversees Deep Futures research, analysis and the "contextualization" of knowledge on the European operational environment in support of Deep Futures risk and opportunity analyses. Mr. Busch joined EUCOM in 2007 after retiring from the USAF as a Lieutenant Colonel. Upon his arrival, Mr. Busch was responsible for developing the EUCOM Theater Intelligence Strategy. This position evolved into the Deep Futures lead.

Mr. Busch presented the EUCOM perspective on futures research and the social sciences. The IC is inadequate to see issues in Phase 0 and social science research can help inform this forecasting area. Futures research is based upon the idea that information already exists and with a reasoned research plan it can be uncovered. Through putting these insights into a central repository, planning will become more thoughtful and better.

A major factor of futures research is examination of environments. Through examining environments for factors that may surprise us more preparation and better plans can be made. Sharing knowledge is critical in this. The client of the futures project typically has preexisting knowledge of an environment or situation that can be incorporated into the project. This allows the client and the producer to move forward in understanding together.

EUCOM's deep future model is to discover, exploit, create, and then disseminate knowledge. This procedure has three options. The first is to take a "snap shot" of the operational environment to capture phenomena that might be of surprise. Second is the insight line, which looks at emerging phenomena and assesses desired end states. This option is not actionable. This emerging insight gets better over time. Finally, the third option is the deep book. This is actionable insight that a commander can look at and make a decision on.

All deep futures options are on information technology, however, a tool that can ingest knowledge and provide insight is still necessary. This tool will need to inspire capability to allow for sentiment analysis and make sense of them in a timely manner. Through keeping

various deep futures products unclassified, they can be extended to others throughout the community, deepening knowledge across the board.

RDML Norman Hayes, U.S. Navy

Rear Admiral Norman R. Hayes is the acting Program lead for the OPNAV Insider Threat program as the Special Assistant to DCNO N2N6. Prior to his current assignment he was the Director of Intelligence, United States European Command, Germany, through August 2012. He was responsible for all theater intelligence systems, plans, policy and contingency intelligence activities of U.S. Forces in Europe. He also served until January 2010 as the Director, National Security Operations Center (NSOC) at the National Security Agency, Fort Meade, MD.

RDML Norman Hayes, U.S. Navy, described the future environment, strategy, and opportunities for the U.S. and the importance of deep futures analysis. The U.S. is not very good at understanding how environments change over time. Deep futures analysis allows for greater understanding of phenomena in our increasingly complex world.

Deep futures analysis centers on increasing understanding in a deeply complex and changing world. This new order requires new ways of thinking in analysts and their bosses. Currently, analysts are told one way to do things and they do it for fear of stepping out of line. Through increasing the acceptance of different modes of information gathering greater understanding of the changing world can be gained.

In the 2015-2020 environment, the world will be confronted with economic, environmental, and political challenges, which deep futures analysis attempts to marry. For example, China will become a major challenge. Chinese political instability is likely to increase due to the rise of the middle class and leadership changes. Successful strategies for handling these challenges will be based upon knowledge of trends, including maintaining an anticipatory perspective, to forecast societal shifts and adapting to these shifts. Demographic analysis is particular insightful futures analysis. Countries are getting older, birth rates are decreasing, and urban populations are increasing while fewer people are middle class. How will these trends affect the policies?

Security challenges require shared understanding across multiple communities in order to build understanding. Futures analysis needs to be unclassified and free thinking. Connections must be made across disciplines in order to arrive at conclusions that are useful for building future policy.

Discussion

The discovery of unknowns is done through follow up questions, how is discovery of that kind of knowledge built into the QRT and how is analysis of that data build into deep futures?

Mr. Martin said that the information is present but it is not being taken advantage of. There is organizational information of who is operating in the area of interest. Trust relationships

need to be built inside and outside of government. The academic community is very influential in this process as well, and is able to provide different perspectives than the USG. Once the information is gathered, it is important that it is analyzed and disseminated to partner organizations.

How do you take this body of information and apply it to deliberate plans. We learn from the past rather than realize the future is very different in the security community. How do we become more agile and how does your work lend itself to this trajectory?

Mr. Martin stated that is it important to establish a baseline. The research is assembled and gaps are recorded and filled in. Through conducing scenarios, "what ifs," and vignettes, researches can build on that to gain more insight.

Mr. Busch noted that strategy rarely withstands the first contact. The goal is to refine analysis and the planning process so that the strategy can withstand this first contact, with as many nuances as possible.

Does understanding why assessments change over time help for your future futures analysis?

Mr. Fairall noted that one thing that happened very quickly was the increase in the number of conversations that we had with our clients about making our product useful. In 1997, 2010, and 2017 a purple book was, or will be, published which discusses future challenges. A retrospective was conducted on the 1997 version in an attempt to understand what forecasts were made. If it could be done, there were attempts to understand why these forecasts were right or wrong. The more specific an assessment, the more likely it is to be wrong. This process was difficult because for the 1997 document there was no understanding of how or why the forecasts were made or thought about. Now, all of the thought processes are kept track of. Finally, the first chapter of each purple book is lessons learned and why.

Conclusion

Dr. Cabayan concluded the meeting by thanking the panelists and participants for their contributions.

Appendix A: Agenda

6th Annual Strategic Multi-Layer Assessment (SMA) Conference

A World in Transformation: Challenges and Opportunities

Jacob E. Smart Building, Joint Base Andrews, 6-8 November 2012

Day One **Tuesday, 6 November 2012**	
0730 - 0800	**Registration and Coffee**
0800 - 0805	**Administrative Remarks:** Ms. Margaret Egan (SRC)
0805 - 0820	**SMA Overview:** Dr. Hriar Cabayan (OSD)
0820 - 0910	**Guest Speakers:** Mr. Earl Wyatt (OSD, ASD (R&E)/RFD); Mr. Ben Riley (OSD, ASD, (R&E)/RFD); Maj Gen John Shanahan (J3 DDGO)
0910 - 0940	**Key Note Speaker:** LTG Michael Flynn (Director, Defense Intelligence Agency) "Reshaping Defense Analysis"
0940 - 1000	**Break**
PANEL DISCUSSIONS	
1000 - 1130	**Panel One** **Future of Conflict** Moderator: Mr. Dan Flynn (DNI/NIC) Panelists: Mr. Elbridge Colby (Strategic Analyst, CNA); Dr. Jacqueline Deal (President, Long Term Strategy Group); Dr. David Johnson (Director, Chief of Staff of the Army Strategic Studies Group); Dr. Thomas Mahnken (John Hopkins University/SAIS, former DASD for Policy)

1130 - 1230	**Lunch**
1230 - 1300	**Invited Speaker:** Dr. Robie Samanta Roy (SASC) "The Social Sciences and the Valley of Death"
1300 - 1400	**Panel Two** **Social Sciences and their Role in Supporting Future National Security Challenges** Moderator: Dr. Dan Plafcan (OUSD(I)) Panelists: CAPT (Dr.) Dylan Schmorrow (OSD AT&L); Ms. Nicole Sponaugle (DIA); Dr. David Adesnik (IDA)
1400 - 1500	**Panel Three** **Populations in their Environments: What can Remote Sensing Tell Us About Stability and Resilience?** Moderator: Dr. Chuck Ehlschlaeger (USACE, ERDC) Panelists: Dr. Karen Owen (George Mason University); Dr. Amy Pate (UMD); Dr. Molly Brown (NASA)
1500 - 1530	**Break**
1530 - 1630	**Panel Four** **MINERVA Priorities for 21st Century Defense** Moderator: Dr. Erin Fitzgerald (OSD AT&L) Panelist: Dr. Pauline Kusiak (OSD(P)); Dr. Antulio Echevarria (Army War College Strategic Studies Institute)
1630 - 1645	**Wrap Up**

6th Annual Strategic Multi-Layer Assessment (SMA) Conference

A World in Transformation: Challenges and Opportunities

Jacob E. Smart Building, Joint Base Andrews, 6-8 November 2012

Day Two **Wednesday, 7 November 2012**	
0730 - 0800	**Registration and Coffee**
COMMAND DISCUSSIONS	
0800 - 0900	**Feedback from Commands:** What are the pressing needs in your Commands? Moderator: Brig Gen Timothy Fay, (JS, J36) Panelists: Brig Gen Richard Stapp (J8); COL Mike Albaneze (PACOM); CDR Wesley Price (CENTCOM); Mr. William Busch (EUCOM); LTC John Ferrell (SOUTHCOM); Pat McKenna (STRATCOM); LTC Ari Kestner (DDSO); Col Bryan Cannady (CSIS); Ms. LeAnne Howard (SOCOM)
PANEL DISCUSSIONS	
0900 - 1000	**Panel Five** **Disruptive Or Diffusive Technologies? Understanding The Impact Of Technology On Individual Empowerment** Moderator: Mr. Chris MacPherson, (OUSD(P)) **Panelists:** Mr. Jeff Moss (Vice President and Chief Security Officer of the Internet Corporation for Assigned Names and Numbers (ICANN)); Mr. Andrew Cedar (Director for Global Engagement on the National Security Staff at the White House); Ms. Yasmin Dolatabadi (Principal, Google Ideas)
1000 - 1030	**Break**
1030 - 1100	**Invited Speaker:** LtGen Robert E. Schmidle Jr. (Deputy Commandant for Aviation, USMC) "Psychological and Social Theories in Radicalization and Terrorist Networks"
1100 - 1300	**Panel Six**

	Insights from Neurobiology on Influence and Extremism: Moderators: Ms. Abi Desjardins (NSI); Dr. Diane DiEuliis (HHS) Panelists: Dr. Pete Hatemi (Penn State); Dr. James Giordano (Potomac Institute for Policy Studies); Dr. Rose McDermott (Brown University)
1300 - 1400	**Lunch**
1400 - 1500	**Panel Seven** **Insights from Neurobiology on Influence and Extremism: Operational Perspectives** Moderators: Col Marty Reynolds (JS, J3, DDGO), Col William Young (MIT) Panelists: Dr. Bill Casebeer (DARPA); Mr. Jason Spitaletta (APL); COL Tom Evans (JS J39 MISO); COL Matt Venhaus (OSD SOLIC); Dr. Panayotis Yannakogeorgos (AFRI)
1500 - 1530	**Break**
1530 - 1700	**Panel Eight** **Deep Futures; How to Dive Deep in the Operational Environment** Moderators: Mr. Bill Busch (EUCOM); Dr. Chris Rice (USA) Panelists: RDML Norman Hayes (DCNO); Mr. Josh Kerbel (DIA); Mr. Richard Martin (JS, J7); Mr. Jesse Fairall (DIA)
1700 - 1715	**Wrap Up**

Appendix B: Participants

Adesnik	David	IDA
Agee	Collin	NGA
Agoglia	John	IDS International
Albro	Robert	American University
Aldrich	David	Research and Engineering Development
Ankori-Karlinsky	Lee-Or	Project on Justice in Times of Transition
Aprahamian	Mireille	Marine Corps IO Center
Astorino-Courtois	Allison	NSI
Atoui	Marwan	DARPA Support
Azmi	Zal	CACI
Barnett	Wendy	OSD
Beatty	Jeff	TRADOC G-2, HTS
Billau	Daneta	DIA
Blair	David	Ph.D. Student Georgetown
Bossar	Albert	IDS International
Brearcliffe	Dale	LLNL
Brechwald	Matt	DOS
Brown	Gary	ONR
Brown	Molly	NASA GSFC
Brown-Vanhoozer	Alenka	NDU
Broz	Joseph	Universtity of Chicago
Bruns	Nick	Globimus
Buche	Joseph	DARPA
Bunn	Elaine	NDU
Burns	Lauren	IDA
Cabayan	Hriar	OSD, DDRE
Canna	Sarah	NSI
Casebeer	William	DARPA
Cedar	Andrew	NSS
Charney	Craig	Charney Associates
Chauvin	Cherie	National Academies of Science
Chow	Edward	NASA Jet Propulsion Laboratory
Cigar	Norman	MINERVA Chair, Marine Corp Univ.
Colbath	Sean	BBN
Colby	Elbridge	CNA
Combs	David	Navy
Coyne	Joseph	NRL

Dahlhauser	Karl	OSD
Dahm	Evelyn	IDS International
Dangelo	Bill	Navy
D'Angelo	William	NAVY
Day	Robert	Air Force Dir. Innovative Initiatives
Deal	Jacqueline	LT Strategy
Delzoppo	Bob	SRC
DeMartino	Anthony	DIA
Des Lauriers	Art	Lockheed Martin
Desjardins	Abigail	NSI
Dicapua	Marco	DOE
DiEuliis	Diane	HHS
Dimolitsas	Spiros	Georgetown
Dixon	Don	DOD IG
Dolatabadi	Yasmin	Google
Downes	Karen	National Center for Medical Intelligence
Downes-Martin	Stephen	Naval War College
Downs	Cathryn	NDU
Dubicka	Irene	DOE
Dunn	Jerome	Navy
Dzakowic	Jerry	LLNL
Echevarria	Antulio	Army War College
Edwards	Jennifer	USMC Intel Activity
Egan	Kathleen	TSWG
Egan	Meg	SRC, SMA Team
Ehlschlaeger	Charles	ERDC
Elder	Robert	GMU
Eyre	Dana	SOSA Corp
Fairall	Jesse	DNI
Fall	Chris	Navy
Farrell	Kevin	Navy Cyber Warfare Development Grp
Fearey	Bryan	LANL
Fenstermacher	Laurie	Air Force, AFRL
Fields	Jeffrey	DTRA
Fitzgerald	Erin	OSD, AT&L, MINERVA
Flynn	Dan	ODNI, NIC
Flynn	Michael	DIA
Fogg	Glenn	OSD, RRTO
Fox	Jonathan	DTRA
Frank	Jim	TSWG
Freedman	Heather	DIA

Gabriel	Gary	Dep Chief, Cyberspace Ops USAF
Gaskill	Katrina	JIOWC, SAIC Contractor
Geller	Armando	scensei.com
Giordano	James	Potomac Institute for Policy Studies
Glavy	Matthew/Skirt	Aide to LtGen Schmidle USMC AVN
Glissman	Cecily	Sandia
Goolsby	Rebecca	Office of Naval Research
Gotchel	Andy	JWAC
Guermantes	Lailari	TSWG
Gupta	Dipak	San Diego State
Hamid	Tawfik	Potomac Institute for Policy Studies
Harms	Aaron	Monitor 360
Hatemi	Pete	University of Iowa
Haufler	Amy	Johns Hopkins University Applied Physics Laboratory
Hayes	Norman	DCNO
Heimann	Richard	DARPA Support
Hein	Amy	DARPA
Hein	Amy	DARPA
Henderson	Cortney	DIA
Herlinger	Shenoa	DARPA Support
Hermann	Peg	Moynihan Institute
Hibbeln	Brian	OSD
Hill	Jean-Pierre	DOD IG
Hillyer	Joe	IDS International
Hochstedler	Amber	DARPA Support
Hoffman	Mark	Lockheed Martin
Hoven	John	Economist, Dept of Justice
Huckabey	Jessica	IDA
Hutchinson	Kira	TRADOC G2
Jackson	Emily	Marine Corps Intel Activity
Jackson	Gary	SAIC
James	Kiva	SFSU
Jessica		DNI
Johnson	David	NGO
Keagle	James	NDU
Kelly	John	NDU
Kiefer	Matthew	DIA
King	Chris	TRADOC G-2, HTS
Kohlmann	Evan	Flash Point

Kozemchak	Paul	DARPA
Kratz	Kurt	OSD
Kusiak	Pauline	OSD Policy
Laborde	Kent	OSD
Laforge	Lindsay	Effective States
Laird	Donald	IDA
Lamson	Brian	OSD
Lee	Howard	TRADOC
Lefkowitz	Josh	Flash Point
Lejeune	Peter	IINPS
Limbago	Andera	Berico Technologies
Linkov	Igor	Army
Looney	Shannon	American University
Lovett	Alexander	OSD AT&L/ASD R&E/RFD
Loy	Kent	Georgetown
Lozar	Robert	ERDC
Lubavs	Arturs	DIA
Lungu	Sorin	DOS
Lyle	David	Air Force
Lyon	Elizabeth	OSD, AT&L
MacPherson	Christopher	OSD, Policy
Mahnken	Thomas	Naval War College
Mallin	Monty	DOE
Martin	Rick	DD JS J7, JCW
Mason	Patrick	OSD
Mattei	Inna	EUCOM Deep Futures
McCaig	Timothy	DOD IG
McDermott	Rose	Brown University
McGee	Anne	Georgetown University
McGhee	Joseph	University of California
McGrath	Brendan	DOD IG
McQuade	Jill	OSD, AT&L
Meeker	David	DARPA Support
Miller	Gerald	OPNAV EW and CW
Milliken	Charlene	DHS
Mitchell	Darphaus	Air Force, A10
Mittu	Ranjeev	U.S. Naval Research Laboratory
Monroe	Ray	Naval Postgraduate School
Moss	Jeff	ICANN
Mottaleb	Ayman	Languages/Cultures Dept USN
Murtugudde	Raghu	University of Maryland

Nielsen	Eric	USACE
O"Donnell	Tom	Battelle
O'Brien	Dan	Battelle
O'Connor	Jennifer	DHS
O'Connor	Tracy	OSD, AT&L
Oren	Jared	USACE
Ott	Victor	DTRA
Palmer-Moloney	Jean	US Army
Parhad	Rita	Monitor 360
Pate	Amy	Univ of Maryland, START
Patterson	Jim	DTRA
Perkins	Timothy	Army, ERDC
Petrovich	Eileen	DIA
Picucci	Peter	IDA
Pilram	Darya	MPH - Global Health (D, M&E)
Pirmohamed	Noorin	DIA
Plafcan	Dan	OSD, Intelligence
Popp	George	NSI
Prinslow	Karl	TRADOC
Quizon	Rachel	Johns Hopkins University Applied Physics Laboratory
Rakestraw	Hilary	JS
Randall	Doug	CEO, Monitor 360
Rhem	Sam	SRC, SMA Team
Rice	Christopher	TRADOC G2
Ridgon	Mary	National Science Foundation
Rigdon	Grace	DARPA
Riley	Ben	OSD, DDRE/RFD
Romero	Victoria	Charles River Analytics Inc
Rosen	Stephen	Harvard
Ross	Jeffrey	Univ of Baltimore
Rubin	Brigitta	MITRE
Ruenes	Eric	DIA
Ruenes	Eric	DIA
Schaefle	Nathaniel	DOS, Science & Technology
Schmidle	Robert E.	USMC Aviation
Schmorrow	Dylan	OSD, AT&L
Scott	Gerald "Scotty"	NPS
Scully-Power	Paul	INSCOM
Sengupta	Somnath	BAE

Serafini	Enrico	Battelle
Shaffer	Robert	DIA
Shilling	Billy	ONI Farragut Technical Analysis Ctr
Short	Jennifer	National Center for Medical Intelligence
Shortland	Neil	Pennsylvania State University (ICST)
Sibley	Ciara	NRL
Sitterle	Valerie	Georgia Tech Research Institute
Slater	Allyson	Social Scientist TRADOC
Sloan	Beverly	OSD, AT&L
Smith	Erin	DIA
Smith	John	USAF
Smith	Teresita	DIA
Smithers	Samuel	OSD
Speckhard	Anne	Georgetown Univ Med School, Psychiatry
Speight	Elainena	DOD IG
Spence	Michael	OSD, Intelligence
Spitaletta	Jason	USMC
Sponaugle	Nicole	DIA
St Clair	Carley	NSI
Stanislawski	Bartosz	ODNI
Stechbart	Meredith	Monitor 360
Stewart	Chris	Gallup
Stirbl	Robert	NASA
Sullivan	Shaun	OSD
Tangney	John	ONR
Taylor	Aaron	USAF
Taylor	Rebecca	DOS
Taylor	Ron	Nat Research Council
Torrington	Geoff	NRO
Upchurch	Edwin	NASA
Veazie	Todd	WHO
Veeravalli	Swathi	USACE
Venhaus	Matt	OSD, SOLIC
Voyadgis	Demetra	USACE
Walker	JC	SRC
Wallower	Christopher	DOS Diplomatic Security Service
Warner	Elizabeth	Booz Allen Hamilton
Weil	Shawn	Aptima, Inc.
White	Christopher	ERDC
Whitney	Paul	PNNL
Willcox	Jordan	SOSA Corp

Williams	Brian	IDA
Williams	Brian	IDA
Williams	Rob	DNI
Wilson	Tracy	PNNL
Winkler	Robert	DARPA
Wright	Brian	DIA
Wright	Dominick	IDA
Wyatt	Earl	OSD, AT&L
Yannakogeorgos	Panayotis	USAF
Young	William "Dollar"	MIT

Appendix C: Acronyms

AAT	Assess, Access, and Target
ACTD	Advanced Concept Technology Demonstration
APL	Applied Physics Laboratory
AOR	Area of Responsibility
AISC	Advanced Integrative Scientific Convergence
C2	Command and Control
CBCT	Cyber Based Communication Technology
CCP	Chinese Communist Party
COCOMs	Combatant Commands
CTTTF	Chairman Combating Terrorism Technology Task Force
DDGO	Deputy Director for Global Operations
DoD	Department of Defense
FEWS NET	Famine Early Warning System Network
fMRI	functional Magnetic Resonance Imaging
HSCB	Human Social Culture Behavior
ICANN	Internet Corporation for Assigned Names and Numbers
IC	intelligence community
IDA	Institute for Defense Analyses
IO	Information Operations
ISR	Intelligence, Reconnaissance, and Surveillance
JCTD	Joint Capability Technology Demonstration
JDS	Joint Data Support
LTSG	Long Term Strategy Group
M & S	Modeling and Simulation
MAROB	Minorities at Risk Organization Behavior
MEG	Magnetoencephalography
MISO	Military Intelligence Special Operations
MOE	Measures of Effectiveness
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PNT	Precision, Navigation, and Timing

RCU	Rich Contextual Understanding
RFD	Rapid Fielding Directorate
RMA	Revolution in Military Affairs
RRTO	Rapid Reaction Technology Office
SASC	Senate Armed Services Committee
SMA	Strategic Multilayer Assessment
SME	Subject Matter Expert
SPECT	Single Photon Emission Computerized Tomography
SOF	Special Operation Forces
SSI	Strategic Studies Institute
SSG	Strategic Studies Group
START	National Consortium for the Study of Terrorism and Responses to Terrorism
TCO	Transnational Criminal Organization
TTP	Tehrik-i-Taliban Pakistan
USG	United States Government
VNSA	Violent Non-State Actors