Social and Behavioral Science for National Security:
A Government Workshop held at National Academies of Science
31 January 2017

Two groups, Section A and Section B, held simultaneous meetings. Each had 35 participants, a convenor, and five facilitators who led discussions over similarly broad areas of social and behavioral science of interest to the security community. Representatives from the following government elements were represented in the two sections: Air Force, AF National Air & Space Intelligence Center, AF Office of Special Investigations, Army INSCOM, Army Military Intelligence Readiness Command, Army TRADOC G2, Army Soldier Support Institute, Army Research Organization, Central Command, Central Intelligence Agency, Department of Homeland Security, Defense Intelligence Agency, DoD Minerva, DoD Office of Secretary of Defense, Department of Energy, Mitre, National Intelligence Council, National Intelligence University, National Reconnaissance Office, National Science Foundation, National Geospatial-Intelligence Agency, National Security Agency, Office of Director of National Intelligence, Office of Management & Budget, Office of Naval Research, Pacific Disaster Center, SOCOM, SOLIC, Sandia Labs, State, Treasury, USAID, USDA, US Institute of Peace.

SECTION A

Questions and concerns during introductions

- Understanding what analysts bring to the subject under analysis (skills, personal experiences, education, biases, etc.)
- How do we overcome "group think" and shared assumptions due to similar training?
- How do you get a workforce of area specialists to embrace big data/quantitative analysis? How do we explain and distribute intelligence products based on big data analysis at multiple levels of a given government organization? How do we translate this new analysis for different intelligence consumers across government with a variety of education and professional backgrounds?
- How do we influence social media/network nodes rather than just passively collect information from them?
- Mapping human geography; the interactions of humans and geography. How do we understand geography's impact on conflict and make it applicable to current situations – bringing it out of the realm of research and making it actionable?
- How do we keep analysts current with regards to new forms of big data and social media analysis? How do we bring new analysts "up to speed" on the new techniques? How do we apply complex analytics to intelligence problems?
- How do we apply social science and behavioral studies to identify, assess, and mitigate insider threats? How do we apply new forms of personality assessments?
- How do we build a better internal IC infrastructure for collaboration?

Segment A1. US AID

- Incorporating new forms of analysis, data analytics, and geospatial analysis into traditional intelligence analysis by area experts.
    - Need to convince agencies of the value of these new forms of analysis.
    - Need to apply new forms of analysis to fit into the decision making process in order to make more timely and relevant to the consumer.
    - Greater study needed on the consumer side to accomplish this.

- Questions to group:
    - What are your difficulties relaying information to consumer?
    - How should information be relayed to consumers?
    - How does timing influence decision-making?

Segment A2. Sandia on complexity

- Applying complexity science to the "Three Dimensions of Decision Making":
    - The mindset of the consumer
    - Timeliness of the analysis
    - Presentation of the analysis

- Most big data analytics focuses on current data. Historical data will need to be incorporated more generally.
- Need to improve communications across scientific disciplines, particularly between social and behavioral sciences and researchers in other areas, such as engineering.
- Questions to the group:
    - How do we apply complexity science to a problem like terrorism?
    - How can we communicate with decision makers about complex system behavior?

- Regarding "dirty" social science data: the data are always approximate – this creates difficulties with regards to social science data's incorporation into quantitative models.
- Providing risk factors, while useful at an abstract level, are not very useful at the practical policy level.
- Operators/Analysts need to be able to communicate IC research needs to SBS researchers.
- How we look at big data and new analytical capabilities today may not be how we look at them 5 to 10 to 20 years in the future. Things are changing fast. How can the intelligence community adapt more rapidly to technology advances?
- How can the IC balance the need to understand the issues of today with the need to understand the issues of tomorrow?
- The perennial need to balance what the intelligence consumer *wants* versus what is *possible* and *needed* and *not asked for*. How can social and behavioral research and decision makers become aligned with each other?

Segment A3. NSA behavioral science

- Important focus areas for NSA behavioral science representative - 3A's: (Systems) Architecture, Analytics, Augmenting Analyst/Human Productivity
- Big data should be informed by theory.
- Using social and behavioral science to mitigate biases, such as selection bias, during intelligence research analysis.
- The problem of "bad data" and its compromising effect on big data analysis, especially when introduced with malicious intent. Is there a way to track this and defend against it?
- Are there trackable indicators that can help to identify an insider threat? What about indicators of radicalization? What can social and behavioral science tell us about this and how can they help address the challenge?
- How can IC research needs be communicated to uncleared researchers?
- How can the government be encouraged to leverage emerging technologies?

Segment A4. SOCOM modeling

The following diagram describes the development of conflict prior to reaching the threshold of violence. A great deal can be done prior to reaching that threshold on the operational continuum or "the arc of change." That is where the Army seeks to develop greater capability.
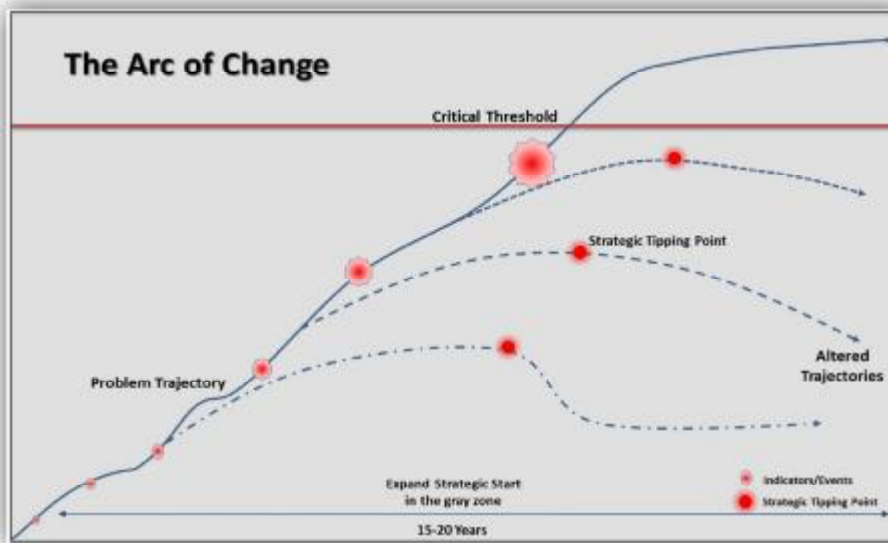
"Expanding Maneuver" describes what land forces must do to win in complex "terrain" that includes perceptions. Force and ideas maneuver through time, space, and purpose across the operational continuum. We weigh both physical and cognitive objectives and the synergy between them, and recognizes the importance of cognitive maneuver to shape the environment and influence populations. Cognitive mass is powerful in a hyper-connected world. Expanding Maneuver seeks to maximize the strategic nexus between the land domain and human domain.

- The military and special operations forces are highly adept at maneuver in the "physical space" but not the "cognitive space".
    o The "cognitive space" is increasingly utilized as a battle space.
    o How do we visualize cognitive space?
    o How can social and behavioral science help the military become more adept at maneuver in the cognitive space?
- How can we map human networks using social and behavioral sciences?

- What is the best way to communicate research to policy makers?
- How do social and behavioral scientists "fit" into the broader field of big data analytics? What can organizational theory tell us about this issue? Will social and behavioral scientists have a role in expanded maneuver planning and operations as subject matter experts?
- How do we get analysts to accept and "become friendly" with quantitative modelling in support of intelligence analysis?
- Data by itself won't solve the whole problem. Theory is needed to understand data.
- Interdisciplinary collaboration is needed to solve problems.
- What is the best way for analysts to properly utilize current social and behavioral science research and data given the fast-paced environment in which they work?
- Analysts should have access to immediately useable research and data.
- What community or part of the intelligence community owns the interdisciplinary perspective? In what community or agency do multidisciplinary analysts fit?
- Government structures are not conducive to innovation. How can social and behavioral sciences help change this?
- Need for greater transparency between academia and the application of their research and analysis to intelligence problems in order to foster greater collaboration.
- How do we maintain the relevance of social science models in light of ever changing circumstances? Can a model or system be built in which data on the changing situation can be "fed" through different theoretical models?

Minerva and Army Research

[The facilitator for this section was not able to attend but forwarded the following notes.]

Several methodology issues require attention in order to make progress:

Multiple disciplines are necessary for understanding the complex social behavior. How do we translate and integrate across disciplines to generate new insights?

Emergence. How do individual-level action and group or population-level dynamics relate?

Multiple environments. Individual and social behavior is situated in the built and natural environments with complex interactions. How do we model context?

Big data sources are enticing but have striking limitations, such as representativeness. How can use big data meaningfully?

Overlooked error. Many theories and models rely on assumptions that are unstated, untested, or simply overlooked. Error is assumed to be random when it is not. Physics models are applied without accounting for essential differences in social phenomena.

Explaining conformity and deviation. Under the same conditions, some individuals will act as expected and others will not. We need to reduce bias and explain both for a full understanding.

Academic groups have generated SBS research priorities (Giles, 2011; Hard Problems, 2010). The following widely recognized challenges are of special interest to the security community:

- How do societies create effective and resilient institutions and governments?
- How can we aggregate information possessed by individuals to make the best decisions?
- How can we understand the human capacity to create and articulate knowledge?
- How and why does the 'social' become 'biological'?
- How can we be robust against 'black swans' — rare events that have extreme consequences?
- Why do social processes, including civil violence, either persist over time or suddenly change?
- How can humanity increase its collective wisdom?
- Can we effectively promote justice (equality, health, civil rights, etc.), and does justice lead to security?

WORKSHOP B

Questions, concerns, and possibilities during introductions

- Untapped potential for research; areas for convergence of physical and social science; areas for global collaboration
- Group formation
- Cultural considerations
- Groups under pressure
- Representing psychological characteristics in agent-based models
- Natural disaster and social resilience
- How do nations as well as individuals flourish or languish?
- Machine learning
- Network analytics
- Technology/human interactions
- Detection of credibility or deception

Segment B1. NGA on Culture and Environment

The social and behavioral unit within NGA is a catch-all research program around environment and culture with focus on understanding how humans interact in and influence their environments. It's a hard research space to define; NGA hoping the decadal survey will help define the tough research questions that need to be answered and provide insight into areas best suited for NGA investment. Facilitator pointed to the challenge of integrating different data sources to address real world problems (e.g., how to manage different measurement uncertainties across different data sources.)

NGA can establish layers of data (e.g., socio-cultural data and geophysical data) and wants to integrate models that draw from these layers. Deviations in patterns are what we seek, and one portion of our work is focused on the social origins of significant signals.

How does the social world interact with physical geography? Is it crucial, merely relevant, or less relevant than we sometimes suppose, and can it be misleading? In terms of human experience, such as travel time, social linkages including marriage, and cultural overlap, the distance between New York and San Francisco is short compared to the distance from each of those cities to Omaha. The experienced world (as opposed to physical earth) is linguistic. It is constructed through information transmission and accelerated by modern media.

In what ways does physical geography continue to matter socially? There are patterns of behavior around geography. Some studies have shown that there is more violence the closer you

get to the equator. Or could that be explained by the remnants of colonialism? Physical geography can also be a mediator or moderator as well as an instigator of conflict.

Next-generation digital natives don't meet in physical space. They don't need to sit together to feel and act well-connected. Cyberspace is where the ideas are, it's how and where we interact.

In many parts of the world, a physical place is inextricably linked with cultural identity, and identity in turn drives a great deal of group behavior. Serbs, for example, are tied to Kosovo. Greeks are unhappy that Macedonia appropriated its name. Time is collapsed within such identities; it doesn't matter that founding events occurred a long time ago.

Some of the patterns in big data don't have anything to do with the traditional analytic categories. It's like Brownian motion, broad movements in whole populations rather than variations among arbitrary types in samples.

Prior to models, NGA may need frames that create a perspective from which to launch questions. Not everything needs to be quantitative. Concepts can be related to pictures. Categorizing everything to prepare for quantification is not always helpful.

Segment B2. US Institute of Peace
The United States Institute of Peace (USIP), with a staff of 350, pursues a vision of a world without violent conflict by working on the ground with local partners building peace from bottom up and top down. It provides people, organizations and governments at every level with the tools, knowledge and training to manage conflict before it can become violent, and to resolve conflict when it does.

USIP continues to ask it can achieve its desired outcomes: How do you get a sound social compact? How do you build trust between conflicting societal groups? How to do you get institutions that are inclusive, accountable, and effective? And how can the international system effectively prevent, manage, and resolve conflict.

Our speaker is currently working on DOD-supported research on how Afghan businesses adapt to insecurity, plus DOS-supported research on the economic causes and consequences of Boko Haram. Additional projects at USIP:

- Police and security force training to improve performance, responsiveness, and accountability
- UN Peacekeepers in sub-Saharan Africa
- Border Security Officials in Tunisia, Morocco, and Algeria
- Train conflict management skills:
  - Women mediators in Colombia
  - Civil Society Representatives in Pakistan
  - Youth Leaders in Egypt

- Build NGO capacity, for example Iraqi peacebuilding organization Sanad
- Peace messaging in in Sudan, Iraq, and Afghanistan
- Facilitate justice and security dialogue between groups to build trust and develop joint solutions

Questions we have about our projects:
How do you make sure trainings are effective? Example of the 2016 meta-analysis of implicit bias found little or no change on behavior. Could be exacerbated by different context. In the field you may be emotionally charged, mentally taxed, and facing different social pressures.

How do you build organizational and institutional capacity? What are successes and failures in Afghanistan?

How to you craft effective peace messaging? A Peace Scholar predoc fellow tested the effect of pro-peace messaging by in-group religious leaders on young Sunni and Shia men in India and found the messages had an anti-extremism effect for one group and a pro-extremism effect for the other group. Betsy Paluck found that an inter-ethnic soap opera in the Congo increased tolerance, but adding a talk show that encouraged discussion erased those gains.

USIP has had limited exposure to SBS, or perhaps isn't sure what SBS they have been exposed to. If you asked around, we USIP staff may point to Emile Bruneau's article on empathy, the story of Cali Columbia mayor Rodrigo Guerrero Velasco, or examples by the nonprofit "behavioral-design lab" Ideas42. USIP faces broader challenges in evaluation:

- With limited resources, the trade-off between how many people receive a program and how well the program is studied.
- A significant challenge across the board is measuring effect, for various reasons. Partners are nervous about measuring effect. Difficult to measure effect on sensitive issues. Measurement is expensive. Challenges to implementing experimental designs

To justify to Congress, we need to demonstrate usefulness and somehow have to find a way to pay for it. We need surveys to know what local people think, with the caveat that comparisons across cultures on standardized measures are difficult. (Voice of American does many surveys in remote and dangerous regions and could be a partner.)

How do we reduce conflict? John Gottman has good work in conflict reduction, though it may be difficult to scale up from personal to group relations. And check Michele Gelfand's research on cross-cultural negotiations.
Is there a tradeoff between stability and violence? The USIP program sounds like it assumes that liberal order leads to a peaceful stability. But is it just as unstable, and perhaps as unpeaceful, as anything else?

After break

The National Science Foundation has started on some large themes that are of interest to the security community. This includes work on identity stereotyping and how threat shapes behavior, the science of learning (formal and informal education), how technology and humans mesh at work (e.g., computers and changing nature of work and working with robots), and resilience of populations with stressed resources. NSF has also been helping with some mathematically modeling with NGA's collections of social data.

According to research by Boaz Keysar, a person's primary language will be affectively charged. If a person talks about a problem using his second language, this is distancing and the person will speak with less affect in a more rational, utilitarian mode.

Segment B3. TRADOC Mad Scientist

The facilitator introduced three initiatives aimed at bringing research knowledge to bear on the operational environment.

1 - Mad Scientist has focused on creating an unclassified, public discourse between industry, military, and science experts. This has provided unprecedented access to experts. open access to experts. They have been livestreaming TED-type presentations by researchers on topics related to changing conflict. A recent interest is megacities. The program also maintains the APAN (all partners action network) website and is running a conference, March 7-8 at Georgia Tech, with a focus on robotics. A science fiction writing contest is under way.

2 – Social Cultural Analytic Framework. A draft document is available for review.

3 – A revised intern program to rethink what it means to use subject matter experts. Attention has shifted to attracting and supporting new scholars. They can publish with us, build their resume, and will likely produce works later that will be relevant to security. But we also want knowledge delivered and used at the speed of the operational environment, which can be even faster than the analytic cycle. The Minerva and Global Trends products are OK, but we need to incorporate the knowledge, find its implications. Sometimes the traditional formats for presenting results are stultifying. We may need cartoons, interaction. The futures group with the Marines are experimenting this way.

The traditional disciplines seem to be focused on solving problems of the past. Disciplines can be artificial and a stumbling block and are being reconsidered in universities of the future. Face to face campuses can be too expensive, and online study can work. These days, it is only the foreigners who can afford a US campus education and they keep them afloat. Ironically, it's the US-based students who are flocking to online options. Opinions differ on these points, but the Army sees that the future is in continuing self-development. A lot of what you learn today is

quickly outdated. You need to supplement with peer education, with meet-ups rather than lengthy programs.

Some object that what you learn in a traditional discipline is foundational, and that if you don't get a foundational education you will waste time repeating and re-inventing. And you also can't neglect history, thinking that the latest trends is all that you need to know. You need a context to order the world, plus engagement more than videos. Nevertheless, projects that cross among the disciplinary silos are the way to go. Knowledge that emerges from integration is valuable.

Segment B4. SOCOM culture surveys

The culture framework was missing at SOCOM. The organization was ethnocentric and suffered for it. SOCOM now combines culturally-aware courses with implementation. It is not all cookbook. SOCOM is able to navigate socio-centric cultures better and make distinctions among them. We had to learn that what worked in Nigeria to bring women into the process as body guards would not work in Libya, where women can't have such roles.

Do soldiers need language ability, in addition to minimal cultural training? This is often too difficult. At a minimum, a person has to know enough to be wary and to find a way to learn quickly. You often can't act correctly based on the abstractions you pick up in class. You have to use what you hear in practical applications into order to really learn it. Soldiers also need to understand the importance of narrative and how to use it. Let people tell their story. "Self first" is not their way, it is a family first with me as a member. You need patience to listen. But no matter what you do, you have to have some humility, because inevitably you won't understand, and you have to acknowledge that your values are not always right. Respect and sensitivity are teachable. But there is a job to do. A solder needs to elicit intelligence, and to elicit well, without unexamined stereotyping, is a difficult skill.

Segment B5. NGA/DIA behavioral science

We are looking for ways to improve human performance. Games are a rich area. At the NAS Summit, Wolf presentation on spatial and visual perception, along with vigilance and attention, was quite relevant. It is actually difficult to know, in many real situations, whether a person is performing well. We don't always have good measures, not a baseline to know what is normal. It is also hard to get analysts to cooperate in studies that can seem intrusive. We have too many non-meaningful metrics and get confused when we try to use them. Rob Johnson, an anthropologist who studied CIA, recommended that we try to straighten all this out with an 'improvement infrastructure.'

We need to keep examining our goals. We probably want only to augment the work of analysts, not replace them with technology.

We need to be wary of quantification and not rush into it where qualitative work, or a combination of the two, is better. There are situations where there is not a lot of data already generated where it would be wise to use human observation first.

But IT, specifically IC ITE and C2S, can give us a lot of support, where there is much data that would normally be difficult to process. Big data has helped in many fields, and there's no reason it can't help in SBS also. What new economic queries can we have? But the allure of big data can overload us with correlations without any theory to explain it. We should keep exploring these methods where we might not feel comfortable and be open to a paradigm shift.

What is it, after all, that makes the world more complex?

Citations

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Hard Problems in Social Science, symposium at Harvard Univ., 10 April 2010 www.fas.harvard.edu/~socsci/Documents/HardProbsSocSciSummaryResultsandPollText_31March2011.pdf

Expanding Maneuver in the Early 21ˢᵗ Century Security Environment, US Army Special Operations Command, 12 Jan 2017.

John Gottman, The Six Skills of Conflict Management   https://www.gottman.com/blog/manage-conflict-the-six-skills/ .

Michele Gelfand.   http://www.gelfand.umd.edu/pages/Research2.html

From *Science*, special section on "Prediction: What can we know in advance about human activities?" sciencemag.org
L. Cederman, N. Weidmann, Predicting armed conflict: Time to adjust our expectations? 3 Feb 2017, Vol 355 Issue p475
The writers fully recognize "the inherent limitations imposed by massive historical complexity and contingency in human systems." Even so, they outline some promising lines of research,

and in addition explain why prediction isn't quite what the decision maker needs: "Scholars producing forecasts typically assume that policy-makers want predictive risk assessments more than anything else because this would allow them to reduce potential conflict through preventive resource allocation and intervention. However, these hopes presuppose that the effects of policy intervention are well known. In fact, theory-free prediction does little to guide intervention without knowledge about the drivers of conflict. Therefore, carefully executed policy analyses assessing the causal effectiveness of conflict-reducing measures are a prerequisite for politically effective macro forecasting. Given the difficulties of obtaining reliable information on key social indicators, especially in developing countries, basic description and explanatory modeling may, in many instances, be more urgently needed than forecasting."