Intelligence personnel met on Nov 14 to generate challenges and questions for the NAS decadal survey. Agencies that were represented:
IC Elements: CIA, NSA, DIA, ODNI, FBI, DoS
Research funders: DARPA, IARPA, DoD Minerva
Educational units: NIU, NDU
DoD: USMC, SOCOM, ARO, JWAC, TRADOC G2, Naval Intelligence, AFOSR, NGIC

A framework concept

The IC is asked to provide insight for every event and question that arises, but many important phenomena are not easily explained based on hard-won facts, open or secret, that IC agencies typically rely upon. Certain patterns are not well understood, such as the following:

- Under what conditions will a protest spread into something as broad as Arab Spring?
- What is the effect of elite cohesion, when does it form and dissolve?
- When do countries cheat on the terms of treaties and other agreements?
- How does the loyalty of security services affect the outbreak of social movements?

Many academic papers have examined these questions. In unusual situations there has been time to incorporate these materials and relevant case descriptions into intelligence products. But rarely is there time to sort through many sources and to arrive at authoritative conclusions. Also, analysts tend to be experts on countries and simply do not keep up with cross-cutting theory.

There are several such questions that have become perennial, arising repeatedly in a wide variety of situations. For these situations, we need some guidance on what is known, to correct against assumptions and groupthink that might be otherwise intrude, explicitly or not, to fill the gap in our knowledge. For these challenges, we should be able to identify the factors that are known to be relevant, and to also put aside the factors that are known not to be relevant, including those that are often accepted without foundation. We should also have on hand perspectives and theories that could help formulate the relationships among these factors, plus relevant case information that we could draw from.

This collection of information on perennial challenges constitutes a framework only. The information doesn't directly provide answers for new situations that arise, but it is a stronger starting point, and this base of knowledge can also be improved and expanded over time. Today, analysts will often want to review SBS knowledge as an input to an analytic task, but there is no time to do so, and this step is simply bypassed. A library of readily adapted knowledge could be incorporated into intelligence at the speed of the analytic cycle.

We would also need to make this collection of frameworks visible for others to use who were not necessarily involved in their creation. Part of this involves packaging the material in ways that facilitate communication and rapid adaptation. A uniform, 3-layer format is proposed: a one-page diagram that can be adapted with new labels that apply to specific situations, a 5-page summary, and a longer paper that includes a synthesis of literature. This format is a point of translation that would be able to express what researchers have to offer while at the same time serving up materials that could be understood and rapidly applied by government analysts. Today, few have the skill or inclination to prepare such materials or to apply them, and thus the process would require development work and practitioner training. This material would be a reliable starting point for incorporating knowledge that has been gained through social and

behavioral science. It would not be treated as frozen doctrine and would not be imposed on the analyst.

A useful way of tagging findings is by unit of analysis and by scale. For example, there are many findings about work organizations that are relevant to national security, and these may or may not relate to findings at other scales such as nation state, culture, or individual actor. There are factors or drivers that either cut across other categories or reside in the common background and play a role in almost any situation. Examples:

- The presence of shared narratives that make certain behaviors and outcomes more likely.
- Global processes in the background, such as long-term shifts in populations, for example the likelihood of Russia becoming majority Muslim by 2050.
- Deception and the possibility that evidence has been manipulated.

There won't be only one recipe for important phenomena such as radicalization. There can be several versions or options, and all would require re-examination and revision.

Any pattern that plays out requires that certain conditions in the environment will hold or that precursor events will occur. Sometimes those contingent conditions change and affect the conclusions.

For any analytic direction we take or any categories that we use to formulate a situation, we are effectively assuming that certain patterns will be significant and others will not. We should encourage members of analytic teams to treat such assumptions critically, question the categories that are being applied or that are being ignored, and in general remain wary of the implicit thinking common to the analytic culture. The fact that something is in the catalog of frameworks does not guarantee that it is the best or only approach to take. The framework, including the diagrammatic summary, can actually be helpful in specifying the commitments being made that need to be questioned. Criticism should also take a positive direction toward identifying gaps in the collection of patterns that could be remedied by further research and self-reflection. Some findings may not replicate and would need to be demoted or removed.

For any framework, we would need appropriate measures, and explanation of how the measures are created and their justification and reliability.

While use of a systems diagram is an excellent way to depict complex relationships within systems that exhibit non-linear behavior, avoiding the limitations of trying to reduce such phenomena to simple linear causes, such diagrams have proved problematic in the past. The diagram that accurately summarized the Army Counterinsurgency Manual was widely ridiculed, even though, for those who had the patience to study it, it was a quite helpful way of summarizing the manual, much better than a table of contents that could not depict the interactions that were essential to understanding the manual. Practitioners recognized the problem and suggested that, in such situations, complex diagrams could be reserved for use by analysts and other, more digestible diagrams shown to customers.

In preparing frameworks, care must be taken to not delegate the work to domain specialists who work only within their domain. Most problems of interest to security involve dynamics that cross domains.

Dimensionality

DARPA puts its attention on "Goldilocks" problems, ones that are obviously important yet are quite difficult and lack established findings, measures, and productive programs. And yet the questions need to be framed in a way that makes useful answers possible.
In most cases, what DARPA expects to address are complex problems, where there are many dimensions and interactions and much uncertainty. This is different from the bulk of social science research where such confounding factors are avoided, often as a necessity to qualify for publication in leading journals.

Why is it hard to answer these questions, what inquiries can advance toward results, what relevant data can be found, what measures can be used? Mega-cities, for example, is a subject matter of importance, but questions are not yet well formulated in a way that establishes a path toward useful findings. Military services are arguing that they need "expeditionary social science," but it is not certain how to do this or whether it will yield reliable results. DARPA seeks more questions in the social and behavioral science that fit their Goldilocks criteria, and some of the perennial challenges formulated and presented in this session appear to be good candidates. Some of the problems can be addressed through broad patterns without understanding the underlying behaviors that produce the patterns, while other questions are amenable to an "emic" approach where meanings as understood by individual actors matter. Some problems are tied to a location, culture, or social enclave of some sort, while others may generalize across different environments.

Agree that the government often needs knowledge in areas where the academic community has done little work. For example, much theory points to the importance of networking as a foundation for civil society, but very little information was available on the depth or character of networking in Russia. A research conference was sponsored by the State Department on this question, and evidence was found of much more networking that expected and this significantly reduced the government's uncertainty about this aspect of Russian society.

Shifting interests

Westerners have some habits concerning knowledge that we need to be wary of. We like to account for events in a linear way, as a product of simple causes that line up in a story. But change occurs through many simultaneous actions. This is part of a broader issue concerning the media for transmitting knowledge. Social organization exerts an influence on knowledge as well. So we need to be concerned about not just the corpus of knowledge but these aspects as well when applying knowledge. In the next round of Minerva funding, bidders will be asked to not only reflect on subject matter, but to also address these additional issues, such as the limits of models, how big data projects may mask as well as reveal understanding, and how we manage ambiguity both in research and decision making. As far as subject matter, several of the target topics are a continuation from prior years but have been shifted in ways that follow DoD interests, including social impact of autonomous systems, resilience, stability, deterrence, and cyber defense.

Minerva has produced some good research, but it is frustrating that it doesn't get fully integrated. We don't have a culture that allows people to think through a problem like a social scientist and readily use the products of research. On the other hand, social scientists will often tend to formulate problems that are amenable to resolution, and that can sometimes simplify the situation so that it is no longer realistic and the results are no longer easily applied. Another habit

is to stick to a discipline, which is where the normal academic incentives lie, but Minerva strongly encourages truly interdisciplinary work and a global perspective.

The schools are producing far too many PhDs for the number of teaching positions that are open. It would make sense to acknowledge this and produce PhDs whose training is shifted from narrow statistical studies in controlled environments to training more suited to solving real problems in business and government. If students were trained in this way, these institutions would start recognizing their value and hire them.

The system of relationships and meaning in other cultures can differ a great deal, and the United States needs a better appreciation of this when making policy. For example, patterns of patriarchy are assumed to lead to insecurity and restricted opportunities for women. The US would want to resist this, except that the recent increase of polygamy in central Asia doesn't quite work out that way. It actually has the result of protecting women and giving them more rights in a system in which they were losing ground.

There is a lot of useful material in Intellipedia about cases, methods, and models that are overlooked. If they were more ordered and accessible, they could be used more often.
We need to add history as a source for our intelligence. There are plenty of accounts of the past that are relevant and yield lessons. But memories are very short and we tend to treat everything as new. Insurgencies are certainly nothing new, and we don't even recognize that the American Revolution had plenty of guerilla fighting.

Social science tends to look at what is readily measured, and this draws attention to simply causal explanations. This is a kind of fiction and can be misleading.

NIU (National Intelligence University) is wary of educational practices that remove students from reality and the application of what they are learning. So while departments have been established at NIU, they are not the same as in outside universities and the set encourages systemic, cross-cutting thought. The College's departments are regional issues, transnational issues, leadership & management, defense strategy, and collection and analysis. The School of Science and Technology Intelligence has concentrations in WMD, cyber intelligence and data analytics, emerging and disruptive technology, geostrategic resources and the environment, and information and influence intelligence.

NIU has been creating a list of questions that they can recommend to their students to take up for the required research project. It would be good if these questions could be lined up with real needs that analysts are facing. DARPA also expressed a need for well-formulated questions that arise from work with policy makers. There was general agreement that such lists of questions could be consolidated across the national defense community, shared in a central repository, updated and annotated, and passed on to multiple groups that are able to conduct research, using any number of methods, to contribute to answers. This collection would also lead to sharing of relevant data and tools. If students understood that their work was expected by somebody who was prepared to use it, they would be highly motivated. Student projects would also reduce the time and expense to conduct preliminary studies with external performers.

Methods to find what works

Academic research emphasizes observation and experiments where there are clear metrics focused on a few well-defined factors where conclusions can be reached. While that does not characterize SBS as a whole, and is not what all academics necessarily want, it is typically what journals require and what counts most toward advancement and tenure. Experimental studies of biases and heuristics, for example, are certainly suggestive, but they don't quite show

how biases and heuristics affect real situations where the problems are ambiguous or how they can be controlled in such environments.

The national security community needs a more realistic approach, and it seems possible to do this and still be able to advance scientifically. A shift to realism or solution-oriented social science would entail the use of a richer set of metrics. The IC itself uses such metrics, such as the judgment of evaluators guided by standards. But the IC has not taken further steps to be scientific in its reviews, such as by establishing whether there is inter-rater reliability, running tests, and tracking improvement. Scientific efforts can begin with the questions we have in the IC, and this would produce something that matters to us and that we could use. This might make some social scientists nervous, but they should be able to tolerate it if there were funding and if institutions were prepared to use their product.

There may be a generational divide here. Younger researchers might adapt better to our needs and able to break with practices, and if that were the path to getting a job, it would have a very strong appeal. Yet there are some in the academy that simply won't work toward the practical interests of clients, especially military and intelligence clients.

The journals still don't match what we need. So maybe the journals should change, or publications on applied work should be given higher value in faculty evaluations.
There may be a quiet revolution that is tending toward what we want, such as the Center for Open Science.

The IC needs to move toward the academic community and go find what it needs. There are conferences on our topics, such as a good one on "nationalities" conducted at Columbia. We can show interest and explain our needs. We are missing a big opportunity if we don't make the effort to connect.

At the NAS Summit a professor told a story about how he went to State INR, thinking that he could be useful, but he discovered that it took him a whole year to learn a different language before he could really have impact.

We could learn from our S&T brethren. It is normal for a physical scientist to obtain grants and sabbaticals and work within government institutions. There is more contact.
Public health is an inherently applied field, and there is less tension over what constitutes proper research. There are other professional schools that we can draw from, such as public policy, business, and engineering.

Additional topics of interest to the national security community

- Common frameworks for formulating social knowledge.
- Understandably, the IC has to work on the ‘who what why’ of conflict, but there is more to consider in the field of conflict prevention and resolution. The IC tends to bypass this knowledge on intervention to reduce conflict.
- Big data and "data scientists" are commanding a lot of attention and funding. Is this worth it, is the work paying off?
- The broader social effects of technical change, especially automation.
- How language, locally and in whole cultures, affects our mindset and understandings.
- How conceptual frames form and change, and especially how identities can drive and create what amounts to separate realities.
- How adversary information operations, especially Russian, confuse our methods.
- The real effects of diversity and inclusion on work behavior and mission completion.
- Cyber personnas, how to conceal and reveal them through the study of behavioral patterns.
- Combining what machines and humans can do in making political forecasts (on the model of stock trading and weather prediction).
- How, when, and why countries cheat on international agreements.
- How discussion in different cultures (face to face and online) gives clues to national development, including how positive and negative emotions of populations and leadership influence development.
- The proliferation of deception, especially in new online media.
- Mass migrations internally and across borders, especially current mass immigration to Europe.
- Communication and action in populations regarding emergencies, disease such as Ebola, and other threats.
- Better ways of collaborating in science, for example the Center for Open Science.
- Influences and biases that mediate the effects of major causes.
- Adversary intentions concerning warfare and weaponry.
- Characterizing the organizations of adversaries, concerning such matters as tendencies for infighting, domination from leadership, bureaucratic tendencies, etc.