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HEARING

ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2009

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES SUBCOMMITTEE HEARING

ON

BUDGET REQUEST ON THE ROLE OF SOCIAL AND BEHAVIORAL SCIENCES IN NATIONAL SECURITY

MEETING JOINTLY WITH

COMMITTEE ON SCIENCE AND TECHNOLOGY

SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

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CONTENTS

CHRONOLOGICAL LIST OF HEARINGS

2008

Page

HEARING:

Thursday, April 24, 2008, Fiscal Year 2009 National Defense Authorization Act—Budget Request on The Role of Social and Behavioral Sciences in National Security 1

APPENDIX:

Thursday, April 24, 2008 33

THURSDAY, APRIL 24, 2008

FISCAL YEAR 2009 NATIONAL DEFENSE AUTHORIZATION ACT—BUDGET REQUEST ON THE ROLE OF SOCIAL AND BEHAVIORAL SCIENCES IN NATIONAL SECURITY

STATEMENTS PRESENTED BY MEMBERS OF CONGRESS

Baird, Hon. Brian, a Representative from Washington, Chairman, Research and Science Education Subcommittee 2

Ehlers, Hon. Vernon J., a Representative from Michigan, Ranking Member, Research and Science Education Subcommittee 3

Smith, Hon. Adam, a Representative from Washington, Chairman, Terrorism, Unconventional Threats and Capabilities Subcommittee 1

Thornberry, Hon. Mac, a Representative from Texas, Ranking Member, Terrorism, Unconventional Threats and Capabilities Subcommittee 25

WITNESSES

Schweitzer, Col. Martin P., Commander, 4/82 Airborne Brigade Combat Team, U.S. Army 6

Segal, Dr. David R., Professor of Sociology and Director, Center for Research on Military Organization, University of Maryland College Park 10

Van Tilborg, Dr. André, Deputy Under Secretary of Defense, Science and Technology, Department of Defense 4

Weiss, Dr. Mark L., Division of Behavioral and Cognitive Sciences, Directorate of Social, Behavioral and Economic Sciences, National Science Foundation 8

APPENDIX

PREPARED STATEMENTS:

Baird, Hon. Brian 38
Schweitzer, Col. Martin P. 69
Segal, Dr. David R. 52
Smith, Hon. Adam 37
Van Tilborg, Dr. André 40
Weiss, Dr. Mark L. 59

DOCUMENTS SUBMITTED FOR THE RECORD:

Our Intellectual Freedom article submitted by John Allen Williams 77

Page

QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD:

Mr. Lipinski 83
Mr. Smith 89

FISCAL YEAR 2009 NATIONAL DEFENSE AUTHORIZATION ACT—BUDGET REQUEST ON THE ROLE OF SOCIAL AND BEHAVIORAL SCIENCES IN NATIONAL SECURITY

HOUSE OF REPRESENTATIVES, COMMITTEE ON ARMED SERVICES, TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES SUBCOMMITTEE, MEETING JOINTLY WITH COMMITTEE ON SCIENCE AND TECHNOLOGY, RESEARCH AND SCIENCE EDUCATION SUBCOMMITTEE, *Washington, DC, Thursday, April 24, 2008.*

The subcommittees met, pursuant to call, at 9:07 a.m., in room 2118, Rayburn House Office Building, Hon. Adam Smith (chairman of the Subcommittee on Terrorism, Unconventional Threats and Capabilities) presiding.

OPENING STATEMENT OF HON. ADAM SMITH, A REPRESENTATIVE FROM WASHINGTON, CHAIRMAN, TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES SUBCOMMITTEE

Mr. SMITH. Good morning. We have witnesses and a lot of other folks in other places, and hopefully while Mr. Baird and I are making our opening statements, Mr. Ehlers will show up. Mr. Thornberry had a briefing this morning and informed us that he would be a little late. So we will just go ahead and get started. So I call the committee to order.

This is a joint committee this morning between the Terrorism, Unconventional Threats and Capabilities Subcommittee, and we are joined by Mr. Baird from the Science Subcommittee on Research and Science Education from the Committee on Science and Technology.

I appreciate all of you being here. We are here this morning to discuss the role of social and behavioral science in national security. I have an opening statement which I will submit for the record. Having read the witness testimonies yesterday, I think this will be a very interesting hearing, which touches on a number of different issues.

Certainly, understanding the culture of the communities that our military forces are going to are critical wherever they are, and it varies from community to community, but it is a critical element in the type of warfare that we are fighting now especially, which is basically counterinsurgency where we are trying to win over the local population. So understanding their cultures, their interests, and their human behavior and how it varies from place to place is critical.

Also very interesting are some of the studies that are going on in terms of evaluating overall populations so that you can begin to

predict behavior of populations, and predicting that behavior can have an impact on military decisions on a number of different levels. That is an area that frankly I don't understand. I am very interested to hear this morning about how we are developing that, as well as the other issues that have been raised.

With that, I will turn it over to my Washington state colleague from the Science Committee, Representative Baird, for any opening statement he has.

STATEMENT OF HON. BRIAN BAIRD, A REPRESENTATIVE FROM WASHINGTON, CHAIRMAN, RESEARCH AND SCIENCE EDUCATION SUBCOMMITTEE

Mr. BAIRD. I want to thank Chairman Smith, Ranking Member Thornberry, and the staff, particularly our good friend Tim McClees for his work on this, and also my staff on the Science Committee and my personal staff. Dr. Ehlers also has been very instrumental in this.

As a clinical psychologist by training, but someone who has taken a great interest in defense issues as well, I find this a particularly exciting and interesting topic. Many members of the public and the media have been surprised to learn about the role of the social sciences in our defense strategies, but as Chairman Smith mentioned, the changes in the type of warfare we are fighting and the situations our soldiers are finding themselves in necessitates this kind of preparation and this kind of research.

It struck me as I was in Iraq last time, we were in one of the new Mine Resistant Ambush Protection (MRAP) vehicles. Of course, when it was discovered or demonstrated that those vehicles saved a lot of lives, we spared virtually no expense to get them in the field to protect our soldiers. As our witnesses are going to report, and from some of the written testimony, some of the interventions that we are seeing and the advice getting to our soldiers in the field from the social sciences are saving lives as well.

Helping to understand that role in our military posture and the training of our troops in an international involvement I think is particularly important, as is the importance of understanding the stresses and opportunities and strains facing our soldiers and their families here at home, and the extensive research that we hear about today in that area is particularly illuminating.

I think it is especially exciting that we have research in this area being done by both National Science Foundation (NSF) and by the armed services. To be perfectly honest, I think joint committee hearings are relatively rare in this institution. We have been siloing elsewhere in the government and realize that was not a good idea. Thanks to Chairman Smith and the staff on the Republican and Democratic side, bringing two different committees which people might not usually see as having common interests together around something like this, I think will be quite illuminating.

So I thank our witnesses today for not only being here, but far more importantly, for your lifetime of service, through your research and your service in the military. Thank you and I look forward very much to your testimony. I am glad you are here and very grateful.

Mr. SMITH. Thank you.

I will now turn it over to Mr. Ehlers for any opening statement he may have.

STATEMENT OF HON. VERNON J. EHLERS, A REPRESENTATIVE FROM MICHIGAN, RANKING MEMBER, RESEARCH AND SCIENCE EDUCATION SUBCOMMITTEE

Dr. EHLERS. Thank you very much. I apologize for being late. I was chairing another meeting, and unfortunately I have to leave for yet another one almost immediately, but I appreciate you calling this hearing. I am pleased to be a part of this joint hearing because I agree that social and behavioral science research has a tremendous role to play in the security of our Nation.

General Patton, who as you probably know did not practice social sciences very well, said, "Wars may be fought with weapons, but they are won by men. It is the spirit of the men who follow and of the man who leads that gains the victory." Social and behavioral research can help us determine what motivates the spirit of our military men and women and their leaders, as well as those who wish our Nation harm.

It is perhaps that last category where we need help in understanding the unorthodox enemies that we face in the world today. I meant "unorthodox" in a non-religious sense. Clearly, most of them are orthodox in the religious sense.

I know that the National Science Foundation is doing yeoman's work in the social and behavioral sciences, much of which could have applications for our military. I look forward to hearing today about the behavioral science research currently being conducted by the Department of Defense (DOD) and how that research is being applied. This issue creates numerous opportunities for these two agencies, namely the Department of Defense and the National Science Foundation, to work together on the research areas recommended in the National Research Council (NRC) and U.S. Army Institute for the Behavioral and Social Sciences study, "Human Behavior in a Military Context."

In the military context, advanced understanding of other cultures, teamwork in complex environments, technology-based training, nonverbal behavior, emotion and behavioral neurophysiology can make the difference between life and death. These factors affect more than the Army combat engineer on the ground in Iraq and her family here at home, or the Navy admiral and everyone under his command.

They also affect all of our service-members, all the families that support them, all of us who they are defending, and yes, even those who threaten our freedom. Therefore, social and behavioral research is of crucial importance to this entire Nation and our own security as we move forward in an ever-changing world filled not only with new technological achievements, but also with increasingly complicated human dimensions.

I certainly want to thank our witnesses for being here this morning. I look forward to their testimony.

Thank you very much, Mr. Chairman.

Mr. SMITH. Thank you.

Now we will go to our witnesses' statements and then go to questions. I want to welcome our panel. I will introduce all of you first, and then go in order in terms of your testimony.

First, we are joined by Dr. Andre Van Tilborg, Deputy Under Secretary of Defense for Science and Technology. Welcome.

Colonel Martin Schweitzer, Commander, Fourth Brigade Combat Team, 82nd Airborne Division.

Dr. Mark Weiss, Division Director for Behavioral and Cognitive Sciences at the National Science Foundation.

And Dr. David Segal, Professor of Sociology and Director of the Center for Research on Military Organizations at the University of Maryland.

Before you start, I just want to echo something that Congressman Baird had said, and that is the importance of joint hearings. What I am discovering in a lot of the areas in national security, particularly now when we are looking at warfare counterinsurgency dealing with all these issues, there is so much crossover from agency to agency.

Traditionally, there has been an enormous amount of crossover in the Department of Defense, just within their different agencies. But now increasingly we are seeing it move over into areas that outside of the DOD. So finding ways for those different organizations to work together and be coordinated is enormously important and we certainly need to start here in Congress. So I appreciate that aspect of this hearing as well.

With that, we will start with Dr. Van Tilborg. Please go ahead.

STATEMENT OF DR. ANDRÉ VAN TILBORG, DEPUTY UNDER SECRETARY OF DEFENSE, SCIENCE AND TECHNOLOGY, DEPARTMENT OF DEFENSE

Dr. VAN TILBORG. Chairman Smith, Chairman Baird, ranking members, and distinguished members of both subcommittee, thank you for this opportunity to discuss the role of the behavioral and social sciences in national security. My name is Andre Van Tilborg. I am the Deputy Under Secretary of Defense for Science and Technology.

This morning, I will limit my remarks to only a few of the department's research efforts that specifically relate to unconventional warfare and the global war on terror (GWOT). First, a very short history lesson apropos to the theme of today's hearing. In roughly the year 512 B.C., a Chinese military strategist named Sun Tzu wrote a remarkably timeless handbook of pithy advice for warfighters called "The Art of War." In this book Sun Tzu writes the following admonition: "Know your enemy." End of history lesson.

Then 2500 years later, a National Academy of Sciences panel on human behavior in a military context reminds us that people are the heart of all military efforts. Similarly, the Defense Science Board (DSB) writes that DOD must gain deeper understanding of how individuals, groups, societies and nations behave. Just last week, the Secretary of Defense told the Association of American Universities that DOD must "further its understanding of foreign countries and cultures with the help of the social sciences research community."

Today, our nation confronts the challenges of irregular warfare. The battlefields are often civilian neighborhoods where our forces come into personal contact with an indistinguishable mix of combatants, innocents and unknowns. Adequate cultural knowledge can make the difference between gun battles and non-kinetic conflict resolution and can be used to shape the optimal balance of combat power and diplomacy.

This fiscal year, DOD's investment in social science research is roughly $150 million, of which about one-third is focused on the topic of today's hearing. That amount represents slightly more than one percent of DOD's science and technology (S&T) appropriations. Relevant social science research is sponsored broadly in the department, including the military services, Defense Advanced Research Projects Agency (DARPA), and the director of defense research and engineering (DDR&E).

The DDR&E launched a vertically integrated research initiative budgeted at $10 million this year called Human Social Culture and Behavior Modeling, HSCB for short. HSCB is focused on developing the required science base and maturing technologies that support cultural understanding and forecasting across a range of mission areas and geographic regions.

As an adjunct to the HSCB, the department is using the small business innovation research (SBIR) program to invest another $10 million this year on topics such as training soldiers to decode nonverbal cues in cross-cultural interactions, and secondary language retention in non-Western languages. In addition, the department's multi-disciplinary university research initiative has made two $1 million per year grant awards to universities for research in computational modeling of adversary attitudes and behavior.

Also, the Army Research Institute funds research into how to think about culture in contrast to how to memorize facts about specific cultures. DARPA is conducting relevant research in a program called Integrated Crisis Early Warning Systems, and also makes considerable investments in foreign language translation technologies.

The human terrain system that Colonel Schweitzer will discuss shortly represents only one of many ways in which the research results from these S&T investments can be employed.

The department coordinates its social science research through many venues, including recent scientific conferences such as the first international conference on computational cultural dynamics sponsored by the Air Force Research Lab (AFRL), and the first international workshop on social computing, behavioral modeling, and prediction, with participation by DARPA, Office of Naval Research (ONR), AFRL, Army Research Office (ARO) and other agencies.

Mr. Chairman, distinguished members, I ask that you recall from my opening testimony the recommendations of the DSB, the national academies, the yes, the military strategist Sun Tzu to learn as much as possible about the behavioral, social and cultural aspects of our adversaries and of the indigenous populations in which U.S. and coalition forces operate.

DOD's S&T enterprise has both anticipated and listened to this advice. In conducting this research, it is crucial that DOD continue

to respect the scientific integrity of the academic disciplines on which we depend.

Thank you for this opportunity to address both subcommittees and for your continued support. Thank you.

[The prepared statement of Dr. Van Tilborg can be found in the Appendix on page 40.]

Mr. SMITH. Thank you.

We will now turn to Colonel Schweitzer. I do want to acknowledge his service. He has just returned 10 days ago, according to my notes, from a 15-month tour in Afghanistan. His unit was the first to deploy with the pilot human terrain team program. So we look forward to your insights from your experience in the field.

Colonel Schweitzer.

STATEMENT OF COL. MARTIN P. SCHWEITZER, COMMANDER, 4/82 AIRBORNE BRIGADE COMBAT TEAM, U.S. ARMY

Colonel SCHWEITZER. Chairman Smith, Chairman Baird, ranking members of both subcommittees, thank you for this opportunity to testify on how mission-critical irregular warfare, nontraditional and non-kinetic enabling capabilities and technology are achieving desired effects in Afghanistan.

Having just 10 days ago returned from a 15-month deployment, let me first thank the Congress and the Nation for your continued support as we persevere against a determined, adaptable enemy. The context of my comments today will be the Fourth Brigade Combat Team, 82nd Airborne Division's experience in Afghanistan, and specifically the significant non-kinetic effects the pilot human terrain system program has provided to our combat leaders at all levels within the brigade.

Let me first explain what the human terrain system is. It is a capability to assist commanders and soldiers to better understand the human terrain they are surrounded by, and discern soft-power means of achieving desired effects. It is built about a five-to eight-person human terrain team, HTT, at the brigade combat team level comprised of social scientists and other trained military personnel. They use a mapping human terrain toolkit to assist with research and analysis and maintain a human terrain data repository concerning the local population, social groups, interests, beliefs, motivating factors, leaders, et cetera.

HTTs do not merely serve as embedded cultural advisers for commanders, but they assist commanders at every level to maneuver formations within local communities in such a manner that reduces the threat to all parties involved. To help with this, there is a theater-specific reach-back research center at Fort Leavenworth, Kansas which provides 24/7 subject-matter expert support for deployed teams.

So what did all this mean for our deployment? It meant by better understanding the human terrain, we reduced the number of kinetic operations that otherwise would have occurred. Not only did we reduce the risk to our soldiers, but we reduced the risk significantly to the communities that we operated within. Subsequently, we were able to assist linking the people of Afghanistan to their government at an incredibly accelerated rate.

The bottom line is my headquarters is uniquely qualified to focus on the enemy as the center of gravity. However, today the people are the center or gravity, not the enemy. The brigade headquarters requires enablers to optimize their effectiveness. One of the enablers is this HTT capability which allows the headquarters to better focus its efforts on the correct center of gravity.

Let me tell you what an HTT is not. The team is not an intelligence-gathering tool which is used to target individuals. My staff is uniquely organized to run the targeting process and link intelligence systems to time-sensitive targeting. The HTT is sourced to its social scientist and is not qualified or trained to provide targeting support.

Last year, the Army fielded an HTT to my unit as a proof of concept. The HTT was immediately value-added and became mission-critical. The team's impacts were exponentially powerful. It reduced our kinetic operations, assisted in developing more effective non-kinetic courses of action, improved the unit's overall situational awareness, improved consequence management, increased host-nation government support, improved the brigade's humanitarian assistance efforts, improved the village assessments, improved information operations capabilities, decreased enemy forces attacks, and decreased ordinary crime in our area of operation.

Without the HTT filter on courses of action and the alternative maneuver tools they identified to create the exact same effect, we would have lost double, in my assessment, the lives both military and civilian. Using HTT capabilities, we reduced kinetic operations by 60 percent to 70 percent during our 15-month deployment.

To illustrate the HTT's effectiveness, I would like to share a few vignettes. In the words of one of my company commanders, "Without the HTT our actions would not have been as precise. If the teams weren't there, I would have cordoned-off the village, gathered local elders and told them what we were doing. I would have told them to show me their personally-owned weapons and if they didn't show us their weapons, we would have taken them. Because of the HTT, I understood my alternatives. If you could have one for every company commander, they would be a phenomenal asset."

According to one of my provisional reconstruction team commanders, "Their expertise rapidly identified who to talk to in the village. We were just ricocheting around before they got there, talking to random people. The HTT saved me an enormous amount of time, 10 to 20 hours per village in terms of who to talk to. I would take those guys any day of the week."

And then finally, the HTT helped the 203rd Afghan National Army Corps in our brigade in developing non-kinetic courses of action during combat operations. To provide a specific example, in the Ghazni Province, the Taliban had regularly attacked the government of Afghanistan leaders coalition, Afghan National Army and Afghan National Police for over five years.

Despite a very aggressive outreach to village elders, the HTT questioned the use of kinetic courses of action in the area, observing that the true power brokers in the areas were the mullahs and not the village elders. After redirecting our outreach effort to the mullahs, the brigade experienced a rapid and dramatic decrease in

Taliban attacks to the point where this area is currently attack-free.

The bottom line is, for five years we got nothing from the people of the Ghazni Province. After meeting with the mullahs, we had no more bullets for 28 days, captured 80 Afghan-born Taliban and 32 foreign fighters without a shot being fired. As a result of this operation last June, Ghazni Province today no longer harbors the shadow Taliban government.

So what was the net effect? When we took over in early 2007, only 19 of the 86 formal and informal districts supported the government. Today, we assess 72 of those same districts support their government. I absolutely attribute some of this change to the HTT.

I could elaborate with more metrics and examples of HTT's success, but let me conclude. We learned that the population is the key to the center of gravity. The enemy is hiding among the people and we must understand the culture to win. However, it is more than just the culture. It is understanding their norms and values from an operational standpoint that creates a bridge between the people and their government which currently does not exist.

The HTT's contribution to the brigades' ability to assess their operating environments, to routinely develop and consider non-lethal input to military planning, and to achieve greater operational success with less kinetic operations is invaluable.

Thank you.

[The prepared statement of Colonel Schweitzer can be found in the Appendix on page 69.]

Mr. SMITH. Thank you very much, colonel.

Dr. Weiss.

STATEMENT OF DR. MARK L. WEISS, DIVISION OF BEHAVIORAL AND COGNITIVE SCIENCES, DIRECTORATE OF SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES, NATIONAL SCIENCE FOUNDATION

Dr. WEISS. Chairman Smith, Chairman Baird and distinguished members of the subcommittees, thank you for the opportunity to discuss the social, behavioral and economic, or SBE sciences, and their relationship to the military. The SBE sciences are concerned with human actions at every level, from an individual's brain to individual behavior, to the actions of social groups and organizations.

From fighting the war on terrorism to understanding and overseeing an immense organization, SBE research can assist military policymakers in developing knowledge-based solutions. About a dozen different disciplines comprise the SBE sciences. Anthropologists study the workings of cultures and societies. Neuroscientists and psychologists probe the inner workings of the mind and brain. Linguists seek the neural basis of language. And economists, political scientists, sociologists, and geographers map the forces at work in today's societies.

Collectively, these researchers study teambuilding, risk management, metrics for assessing U.S. competitiveness, disaster response, radicalization, the dynamics of conflict and much more. Federal support of basic SBE research is largely provided by NSF through grants to researchers, most of whom are located in U.S. academic institutions. NSF provides about 60 percent of the Federal support

for basic research in anthropology, social psychology and the social sciences. For some disciplines, NSF supplies more than 90 percent of the funding.

We estimate that approximately 10 percent to 15 percent of this research might be of clear and immediate interest to the military. In fact, NSF supports significant levels of basic research in all six of the major research areas called for in the National Research Council's Human Behavior in Military Contexts report: intercultural competence, teams in complex environments, technology and training, nonverbal behavior, emotion, and behavioral neurophysiology. Each subject is relevant to the military in a variety of areas, including leadership, training, personnel, social interactions, and organizational structures.

I will illustrate with three recent SBE awards from what I believe is a rich and diverse portfolio of SBE research relevant to the DOD mission. First, the University of Michigan researchers are studying human behavior motivated by ethical or religious beliefs. This research has far-reaching implications for military operations in regions where religious beliefs heavily influence local cultural and political systems.

Second, the Learning in Informal and Formal Environments Center is an interdisciplinary collaboration led by scientists at the University of Washington and Stanford University. Its goal is to unlock the powers of human learning. This research will provide valuable insight to any organization that trains an ethnically diverse population of young adults such as the military.

And third, researchers at the City University of New York are studying our ability to selectively attend to the relevant elements in our environment, while ignoring distracting information. This skill is of supreme importance in a military setting.

Many NSF-supported research projects such as these could inform DOD efforts. With an increasing appreciation of the benefits that accrue to the military by SBE research, NSF and DOD might co-develop innovative solicitations. NSF can also provide expertise on the process of peer review and NSF has very strong ties to the academic community which could be leveraged to help develop new DOD research themes. NSF program managers might also provide the military with novel perspectives on the potential applications of SBE research.

Mr. Chairman and members of the subcommittees, I hope that I have been able to articulate NSF's unique role in supporting fundamental social, behavioral and economic research, and the added value that NSF-supported research might provide to the DOD.

Thank you for the opportunity to appear before you. I would be happy to respond to any questions.

[The prepared statement of Dr. Weiss can be found in the Appendix on page 59.]

Mr. SMITH. Thank you very much.

Dr. Segal.

STATEMENT OF DR. DAVID R. SEGAL, PROFESSOR OF SOCIOLOGY AND DIRECTOR, CENTER FOR RESEARCH ON MILITARY ORGANIZATION, UNIVERSITY OF MARYLAND COLLEGE PARK

Dr. SEGAL. Congressman Smith, Congressman Baird, esteemed members of the subcommittees, I am honored to have been invited to testify to you on the role of the social and behavioral sciences in national security. I have been asked to address four issues, and although I am a professor, I will try to be brief.

First, I have been asked to provide an overview of the University of Maryland Center for Research on Military Organization. The Sociology Department at Maryland is unique in that it has continuously taught courses in military sociology and the sociology of war since World War II. I was not there at the time. Military sociology is a relatively small field and our program is the largest in the nation.

In 1995, the research efforts of a number of faculty and graduate students were consolidated into the Center for Research on Military Organization. We were designated a center of excellence by the Army Research Institute for the Behavioral and Social Sciences, with the dual missions of conducting cutting-edge research and educating a successor generation of military sociologists.

Our research program has four primary foci: diversity in the military, military families, military operations, and the intersection of the military and society. Our program is currently implemented by four faculty members, ten graduate students, and one post-doctoral research fellow.

Since 1985, we have granted 18 Ph.D. degrees to students specializing in the study of the military, with 10 of them since the year 2000. Over the last decade, our research has been supported by over $4 million in extramural funding. More than 80 percent of it has come from the Army Research Institute. About 14 percent has come from the National Science Foundation. About six percent has come from industry. The remainder has come from private foundations.

Second, I have been asked how research such as ours can achieve national security goals. Research in the social and behavioral sciences has afforded America's armed forces maximized soldier and unit performance since World War I when psychologists first developed tests to determine who should serve and in what jobs.

In World War II, a generation of America's best sociologists and social psychologists were mobilized to support soldier morale and performance through survey research and training experiments. Today, as the domestic labor force and the international environment changes, the social and behavioral sciences can make continued contributions.

Understanding the nature of culture and cultural differences, for example, can help soldiers function in a force that itself is increasingly culturally diverse, reflecting the changing ethnic and racial composition of society. It will help them participate in coalition operations where they share the battle space with allies who come from different cultural backgrounds. And it will help them function in unconventional military operations where the opponent is not a

modern army whose soldiers wear uniforms that distinguish them both from friendly forces and from indigenous civilians, but rather irregular forces who blend in with the local population.

In addition, the increasing importance of small units in these operations highlights the potential contributions of research on group processes such as cohesion and leadership, a research area in which the armed forces currently invests less heavily than they did in the years after the Korean War.

Third, I was asked to identify current and emerging areas of research that contribute to the effectiveness of our national security apparatus. Many of the important areas, such as cohesion and leadership, have long been important, but continued research is necessary as research methods and concepts evolve. Others are identified in the 2008 National Research Council report on Human Behavior in Military Contexts, which has been referred to already.

This volume focuses on the contributions of psychology, and particularly on cognitive psychology. Other social sciences and other fields of psychology also have contributions to make. At the individual level, research on the life course decisions of young adult Americans contributes both to an improved understanding of the decisions they make on choices of trajectory, whether they go into the military services, into civilian employment, or to universities, as well as how the Nation can best serve its veterans who have incurred personal cost through their contributions to our defense.

At the institutional level, research on the ways in which American organizations and professions are being restructured can contribute to our understanding of the contemporary military profession, its organization, and its relation to society. In researching the military, new research tools such as computer and Web-based survey research may make data collection easier.

Qualitative research approaches such as ethnographic and archival research can enrich the statistical pictures that our surveys provide. Application of recent theoretical approaches such as culture theory and social network theory can help us understand the structure of the military, its relationship to society, and the adversaries we are likely to have to face.

Finally, I have been asked to comment on how we communicate our findings to DOD and the military services. Part of this is done through normal vehicles of science, meetings of professional associations that span the civilian and military boundaries, and peer-reviewed journals of these organizations. We also contribute to user-oriented scientific reports published by the armed forces. Perhaps most importantly, we have found the military to be enthusiastic consumers of our research and are frequently asked to serve as consultants to senior military leaders and to participate in military conferences and study groups.

Thank you very much for your attention. I will be happy to expand on any of these points and answer any questions you might have.

[The prepared statement of Dr. Segal can be found in the Appendix on page 52.]

Mr. SMITH. Thank you all very much.

I think we will stick to the five-minute rule for everybody. We will probably have time to go around for a second round of ques-

tions if you don't get all of them answered in the first five minutes. I will start.

The first question I am interested in, in focusing on Afghanistan and Iraq, but this can apply elsewhere, how do you gather the cultural information that Colonel Schweitzer talked about in terms of how useful it was? How do you go about figuring out what the rules are in a given Afghan village or Iraqi village? I have also been to the southern Philippines where we are doing some of this. How do you gather that information? How do you basically make sure that it is reliable?

I don't know if Dr. Van Tilborg or Colonel Schweitzer, you can answer that.

Colonel SCHWEITZER. Sir, I will just summarize if I could, and then expand it if there is a requirement. The human terrain teams, we embed them within the provincial reconstruction teams ahead of the operation that is going to be conducted. The provisional reconstruction teams by their very nature have incredible access to the population, but not trust, nor do they understand the human dimension that they are operating within. So using that access vehicle, the human terrain team then engages the community leaders, identifies who they are.

Mr. SMITH. And the human terrain team—sorry to interrupt—is trained how? Are they a mix of military and civilian, or just one or the other?

Colonel SCHWEITZER. They have some uniformed personnel assigned to the teams, but the teams are built around the folks from the social science community that bring the unique skill sets and the processes to do the human dimension analysis, to capture the norms, values, cultural challenges or ways that they operate on.

Mr. SMITH. And they will have some background in the specific culture where they are headed to, I assume?

Colonel SCHWEITZER. Sir, they may, but I have to tell you we found out that that is not a pre-condition. The pre-condition that we found out is the process that the anthropological community has been trained on their whole lives. That process is much more important than their respective regional area of experience.

Mr. SMITH. So knowing what to look for, whether you have seen it before or not.

Colonel SCHWEITZER. Yes, sir. And it does help if they have experiences from that perspective. You know, if they are an Afghan expert, absolutely it is value-added. But we found that it is not a necessity. So they collect up through their engagement, through the constant impression.

Look, here is the other piece. It is not done on one visit. Nothing is done on one visit. This is an Afghan timeline, not a Western watch. So to get the human terrain teams down there, to create the relationships, to get the dialogue going takes time. They have to capture the assessments and the analysis that they are making. And then they bring that back. They use their reach-back to that facility that I spoke of at Fort Leavenworth, Kansas to confirm or deny behaviors. And then they turn that into usable information for maneuver commanders so we can properly engage and operate within those communities, reducing friction.

Mr. SMITH. Thank you.

In terms of the number of these teams that we have, now there are a number of different places other than Iraq and Afghanistan that this is applicable to, I understand, but just focusing on those two places, how many HTTs do we have deployed in either Afghanistan or Iraq?

Colonel SCHWEITZER. Sir, there is a total of eight as of today. The second team just came in yesterday from Afghanistan. It is stationed in the northern portion of the regional command. And then there are six additional teams in Iraq is what my current understanding is.

Mr. SMITH. To really cover those areas, how many would we need?

Colonel SCHWEITZER. Sir, that is a great question.

Mr. SMITH. Go ahead. Throw a big number at me. That is fine, but seriously.

Colonel SCHWEITZER. My assessment is—and this is just mine—that every battalion, every O–5 command, needs a human terrain team assigned to it, and not just at game time. Deploying them is certainly an approach that enables that command to maneuver within the communities, but if we wanted to optimize the battalion's ability to make the people the center of gravity, to link people to their government, those human terrain teams need to be assigned to the unit months before its deployment, so you can train, develop the relationships, go through the training center, conduct a series of simulations, so you train just not the staffs and just not the commanders, but the young staff sergeant who is on the ground in Afghanistan engaging that mullah or tribal leader within a particular village.

Mr. SMITH. So we are talking dozens?

Colonel SCHWEITZER. Sir, for example, I had 12 O–5 commands, eight maneuver, and four PRTs. I would like a human terrain team in each of those O–5 commands. Additionally, I would like one at the brigade level, where I currently have one, and I use it at the brigade level for planning, and then we send it out to their subordinate formations for operational execution.

Mr. SMITH. And how many members are on each HTT?

Colonel SCHWEITZER. Sir, it is stable right now. It is five to eight. It is based upon the problem and size density. Now, frankly it is still a pilot program. I think the ultimate manning has yet to be determined.

Mr. SMITH. Yes. Thank you very much.

Mr. Baird.

Mr. BAIRD. Absolutely fascinating. I want to echo the chair's thanks to all of you.

The issue of training, I used the MRAP analogy earlier. We really rushed those into service, but we probably can't rush folks into this training. But what needs to happen? I saw Dr. Segal nodding his head earlier when Colonel Schweitzer was speaking in terms of getting folks integrated into the force early-on.

I have two questions. What needs to happen in terms of training people to do this? It would seem to be some kind of a hybrid between social science training and understanding how the military works. If academic institutions or businesses or the military itself

were to ramp-up to try to get folks, what needs to happen in that area?

Dr. Segal, I will start with you and then any of the others.

Dr. SEGAL. I will answer anecdotally, because it is the quickest way I know. We have students who are serving officers who come through our program and then go out in the field. One of our Ph.D.s, who by the way applied social network training to help capture Saddam Hussein, is now commanding a Stryker battalion getting ready to go back to Iraq. His sensitivity to what is important in culture is being transmitted to his company commanders and to his soldiers.

Now, this is not a substitute for a human terrain team, but if you have to come in at some level, coming in at the battalion commander, company commander level, and assuming that you can teach some cultural sensitivity at those levels, including them in company and squad training down through the force, I think is a good start.

Mr. BAIRD. Colonel Schweitzer.

Colonel SCHWEITZER. Sir, we were discussing this in the last couple of days. Let me explain it in this manner if I can. When we built the Stryker brigade back in the late 1990's, I think we did that correctly. We did a series of simulations. We developed tactics techniques and procedures. We developed a playbook, if you will. And then we equipped and manned the force. And then we put it in a training environment and we trained it.

With the human terrain teams, one could argue we did this a little bit ass-backwards. We had the maneuver formation and then we gave it a human terrain team and built an airplane while in flight. It is probably not the way we want to do business. So I would tell you let's default back to how we built the Stryker brigade, because what we are developing is a capability and a capacity that ultimately is going to be, I believe, in my opinion, an enduring requirement for military formations to be able to have that skill set in their tool bag to make the people the center of gravity so we can link government to their people.

Mr. BAIRD. A dear friend of mine was former general commander of the 104th Timberwolf Division out of my district. He is of the belief that the reserves might be a good way to do this, and maybe break our reserves into—not break—but assign responsibilities for different regions of the world, and then pre-train people on this kind of skill in addition to their warfighting. Maybe this is not in addition. Maybe this is central to it. Maybe "addition" is the wrong term.

Colonel SCHWEITZER. Sir, where it actually resides, that is certainly one solution. It is probably a bit beyond my purview, but I am convinced that the capability itself is one that is a necessity for new maneuver formations to have. Despite the conflicts that are going to be in the future, clearly this asymmetrical enemy within the population is going to be present. That is now a given. Since that doesn't look like it is going to change and we are going to go back to a symmetrical type of warfare, not having this tool in the kitbag, not being educated——

And I will tell you, it cannot be limited to the officer corps. When I say "commanders," I mean commands. So the squad leaders and

above need to have these skill sets so when they are doing these engagements, they are properly equipped to link in with the human terrain teams, with the eventual reconstruction teams, so they can then create the most important effect, which is freedom.

Mr. BAIRD. Well put. I want to thank you and all your forces for helping to bring that freedom to people.

Dr. Van Tilborg, you mentioned earlier that it is not memorization of facts. It is a way of thinking. Could you expand on that?

Dr. VAN TILBORG. Yes. Actually, I want to follow up a little bit on what Colonel Schweitzer was saying here, the point being to train as many of the deploying troops as possible, not just certain individuals. I think what is critical here is to include language skills. Language is well known to be very important to an understanding of cultures.

I think what we need to be able to do is employ to a much greater degree than we do currently the various forms of immersive training, sometimes referred to as "games," but they are a lot more than games. They are much more serious than that. The department's S&T program has developed some rather important capabilities in this immersive training regime.

We also need to draw more upon distance learning kinds of techniques so that a larger group that goes to be deployed has this kind of knowledge when they go. Thank you.

Mr. BAIRD [presiding]. Thank you very much.

We will go to Mr. Ellsworth and then Mr. Conaway will be after Mr. Ellsworth.

Mr. ELLSWORTH. Thank you, Mr. Chairman.

Thank you, gentlemen, for witnessing here today.

Colonel, thank you for your service. I am glad you are back home.

I was just kind of curious. We are pretty big on stats and numbers. When we are spending the people's money, they like to know this many MRAPs, this many bullets, this many bombs. Can you tell me anything about the measurement of success? I know, Colonel, you were saying that you had this much less violence. Could you tell me a little bit more how you measure?

I know it is a pilot program, but how are you measuring the success that we can report back to our folks or to us?

Colonel SCHWEITZER. Sure. I will first speak to the threat, which unfortunately is measured only in terms of kinetics, the number of bullets fired and the number of people injured, which really is probably a mistake to measure it only in that manner, so let me put two together.

Prior to using the human terrain teams in Afghanistan, the previous five combined operations with the Afghan national army resulted with about 30 or 40 enemy killed, and my memory says about 15 to 20 civilians were also killed. I don't know if that is exactly right, but that is the ballpark.

The five operations we did with the human terrain teams, that we spent just under 6 months, had a total of zero civilian casualties, zero enemy casualties, over 100 Taliban detained, over about 50 cumulative foreign fighters during those five operations. So that is one measure.

Another measure, and I think it is the one that is more important, are the number of districts that are now in support of its government because of one of the human terrain teams' contributions of creating access. The human terrain teams helped us create access to population centers that we previously did not have access to. When I say "we," I am not talking coalition. I am talking the Afghan-led effort which we were in support of.

So what is the effect of that? Well, the effect of that is district and provincial governors being able to get down there to these communities, to be able to address and attend to their needs, and then provide for basic services, which I think is what government is all about.

And then once they did that over a period of time, the people for the first time in 35 years in Afghanistan have an alternate choice, not of oppression, not of this constant fear of death or reprisal, but a government trying to take care of them. It wasn't perfect. It is not perfect today, but the numbers don't lie when we say 19 of 86 districts before we used the human terrain teams, and today we are 72.

Do I think that the human terrain team is the only reason why? No. I think that there are a bunch of things that you guys have sourced, and we are incredibly thankful for what you all have done for us, everything from Joint Improvised Explosive Device Defeat Organization (JIEDDO) to the law enforcement personnel, to the Commander's Emergency Response Plan (CERP) money, to all those things that you are giving unit commanders on the ground. But the human terrain teams played a critical role in creating that access.

Mr. ELLSWORTH. Thank you. What about losses on our side in these HTTs, the civilian members, non-soldiers? Have we had casualties?

Colonel SCHWEITZER. Sir, we have not had casualties to date, but when we talk about the number of casualties on the uniformed side, when I said about the five operations that we did, I left out the coalition casualties. There were no coalition casualties in those five operations that spanned just under six months. So I think it is a contributing factor.

I also have to acknowledge the development and performance of the Afghan government. It is a connected entity. The government is able to develop because it is being provided daily opportunities to provide for their people. It is being able to provide those daily opportunities because of the access that is there. The access that is there has been created or contributed to the creation of the human terrain teams.

Mr. ELLSWORTH. What about the acceptance from the troops, the uniformed people? I know that in my former life, when I would introduce something new to my officers, sometimes there was resistance. Are you meeting that? What is your reaction?

Colonel SCHWEITZER. No. This is my sixth or seventh deployment. I have been deploying since 1989. So when the enemy was the center of gravity, this capability was not required. Now that the people are the center of gravity, I will just use the quotes that I use to my subordinate commanders. It is a desired commodity ca-

pability that we need so we can make the people the center of gravity.

I will tell you that no one likes to get shot at, particularly in Afghanistan. It is an unpopular insurgency. The death of any, whether it is enemy Taliban or an innocent, is a step back. So as we can continue to develop tools that enable us to engage communities and settle the disputes through governance, it is a win for everyone.

Mr. ELLSWORTH. Thank you.

Mr. SMITH [presiding]. Thank you very much.

Mr. Conaway.

Mr. CONAWAY. Thank you, Mr. Chairman.

Thank you, gentlemen.

I apologize if this question re-plows ground you guys have already plowed, but "mapping human terrain" is not a term that I intuitively understand what you are talking about. Could you go through that a little bit and explain exactly what the method is?

Colonel SCHWEITZER. Sir, let me just topically answer that, because what you are asking me is what is this toolbox. Like any mechanic, I understand the toolbox and I can use the tools. I don't know much more beyond that, quite frankly. But simply stated, the MAP HT kit is a piece of hardware. It is a computer laptop. It is used to produce the products and decision-making tools that enable a subordinate commander to figure out how he best can conduct maneuvers inside a respective community.

It is also used as a repository, as a hand-off. So as we do the release-in-place between the brigades, the battalions, the companies, the provincial reconstruction teams, and the human terrain teams themselves, that they have a good, constant hand-off of material and data and information that gets handed-off. So it is really their hardware and software system from my view that provides me those necessary tools that we can then go out and give to our subordinate commanders and sergeants who engage with these communities. Anything beyond that, sir, it is beyond my expertise.

Mr. CONAWAY. Can you give me an example of what a tool is? How do you gather the data that is in the toolkit?

Colonel SCHWEITZER. Okay, sir. We did cover that, so I will just summarize it if I can.

Mr. CONAWAY. Thank you.

Colonel SCHWEITZER. The human terrain teams normally get embedded inside the provincial reconstruction teams.

Mr. CONAWAY. I understand that, but you said it is a tool. What is it that they have gathered? The number of brown-haired folks or—?

Colonel SCHWEITZER. No, no, sir. Let me give you an example and see if that answers it. Sir, the Pashtunwali has 15 tenets. These are basically the values and norms that the Pashtun tribe, which is the largest tribe in Afghanistan, lives under. Those 16 tenets you would think would be interpreted in just one manner. Well, the Suleiman Khel tribe, as an example, is made up of 26 sub-tribes. Those 26 sub-tribes each view the 16 tenets of Pashtunwali a bit differently.

So the human terrain teams get down there inside these communities, get their understanding of how they view the 16 tenets of Pashtunwali, give that back to us. We then incorporate that into

our rehearsals so we can properly maneuver within their communities. So we are engaging the tribal leader of this village, the mullah of that district. So it enables us to better maneuver, reduce the friction, and reduce the risk to everyone involved.

And here is the other thing, sir, that we have found quite interesting. The Afghan national army folks are made up across all of Afghanistan. So their understanding of tribal values and tribal issues are not much greater than some of ours. So these products are used throughout the entire combined force so we can reduce the number of kinetic or potential kinetic activities that otherwise may have occurred.

Mr. CONAWAY. I have been to Fort Riley to see the training teams there, that training regimen. How long does it take to form up an HTT and deploy that team?

Colonel SCHWEITZER. Sir, I don't know that answer because my experience was when I was at the Joint Readiness Training Center at Fort Polk, Louisiana, I started asking for a psychologist in that community because I was ignorant. That is who I needed to help me understand the human terrain. A guy by the name of Steve Fondacarrow showed up out of nowhere and said, what you need are anthropologists or people from the social science community.

So on the third day of my rotation at the Joint Readiness Training Center two months before I deployed, five American heroes showed up and plugged in and helped us grow this capability. So I can tell you that we didn't do it right in terms of how to form, man it, train it, and embed it. The formation that just replaced me linked in with their human terrain team prior to their deployment to their readiness exercise and stayed with them and is with them today. That certainly feels, sounds, and smells like that is more the right link-up.

Mr. CONAWAY. Are we using these tools in Iraq as well, or just in Afghanistan?

Colonel SCHWEITZER. Sir, we are using the tools in Iraq, but that is really about the extent of my knowledge of what is occurring in Iraq. I am fresh back from Afghanistan.

Mr. CONAWAY. Well, thank you for your service.

I yield back. Thank you.

Mr. SMITH. Thank you.

Ms. Gillibrand.

I am sorry. I apologize. Mr. Lipinski was here first. I am sorry. We have a dual committee here. I apologize. I looked at the wrong name on the list. We will get to you soon.

Go ahead.

Mr. LIPINSKI. Thank you, Mr. Chairman.

I want to thank both Chairman Smith and Chairman Baird for holding this hearing today.

I really want to go in a little bit different direction here. As the hearing charter said, we want to explore opportunities for partnerships between the DOD and NSF for this type of research. So I want to go down that road.

Last year, there was a bit of a skirmish over social science research funding with NSF. Chairman Baird led the way and I joined with him to help protect that funding. I am a political scientist, so I have an interest in that. But what I really want to ask is, I want

to start with Dr. Van Tilborg, and then go to Dr. Segal, and then I want to hear what Dr. Weiss has to say about this.

Dr. Segal is in academe. Dr. Van Tilborg has been there. What can and what do you think the NSF should be doing in regard to any partnership with the DOD? I want to also get into how much responsibility do you think NSF has for doing things like this. Should the NSF be purposefully focused on research that could help in this area? Or should we be focusing the NSF so much in a particular direction?

I have started out with a lot of questions. Let me see what you have to say. But is there value to research that is not directly related, say, to something related to the military that we have here, but may in some way tangentially help train somebody, a researcher who then can later do work in this area? So all the questions are on the value of the NSF research. That is why I want to get your ideas on that.

So let's start with Dr. Van Tilborg.

Dr. VAN TILBORG. Congressman, thank you for your questions.

Yes, I am very much in favor of the kind of unfettered basic science research that the National Science Foundation conducts. I think there are often situations where without any kind of knowledge as to how that new understanding from their research will be used, that eventually our nation benefits greatly from that kind of knowledge.

We do in our DOD basic science so-called six-one research program have a lot of grassroots interactions with the National Science Foundation staff. I think it is actually quite common that the principal investigators in the universities who primarily conduct the National Science Foundation's research and our six-one research tend to be if not one and the same individuals, then sitting down the hallway from those people who are supported by the other agency. Of course, they run across each other a lot in the professional societies and world.

My personal view is that, yes, the National Science Foundation does in fact have as part of its charter to be concerned about the national security. That is not foreign to their responsibility. But it is important for them to maintain the relationship that they have with the science community. This is a very long-term relationship that has been established. I think we on the Department of Defense side have to develop the techniques that can draw upon NSF-funded research effectively for our purposes without interfering with their ability to work honestly and openly with their research communities.

Mr. LIPINSKI. Dr. Segal.

Dr. SEGAL. I agree with Dr. Van Tilborg. I think that the mission of NSF to sponsor unfettered research is paramount. At the same time, I think it is important for NSF from the point of view of the country and the academic community to recognize a responsibility to support research generally in the public interest. I think national security is in the public interest.

In terms of mobilizing human capital in support of national security needs, quite frankly I think that NSF brings to the funding of social science research a level of credibility and legitimacy that in

the current environment, and probably since the Vietnam War, DOD has not had, for better or for worse, deserved or undeserved.

There are indeed a number of social scientists who do research that would be relevant to national security who would not go to DOD for funding, and others who probably would, but do not have the same access to Department of Defense-Veterans Affair's (DOD-VA's) broad agency announcements that they do to information on what funding is available through NSF. So I believe that NSF funding in this area would increase the range of social science talent available to be brought to bear on national security needs.

Mr. SMITH. I am sorry. We will have to perhaps come back to this if we have more time.

Mr. Kline.

Mr. KLINE. Thank you, Mr. Chairman.

Thank you, gentlemen, for being here. Colonel Schweitzer, it is good to see you back on this side of the world. I appreciate your hospitality when we were out there a few months ago. It is good to see you here.

I apologize because I wasn't here earlier. Like Mr. Conaway, I don't want to re-plow old terrain for you as I am catching up. So I would just like, if I could, Colonel, to address a question and thought to you. I know that part of the issue that you and others are dealing with over there are the Afghani government leaders themselves. I know that there are a couple of examples. Governor Jemal for example is top-flight, first-rate, but some others not so.

Does this tool—does the system, the HTT and the people who are involved in that—does that help you identify the capabilities, the qualities, if I can use that word, of the Afghani leaders that you are dealing with or that others would deal with?

Colonel SCHWEITZER. Sir, we do not use it in that manner. We used it truly to define the human terrain and the human dimension that we are operating within. We are focusing it on the communities, the tribal challenges, the tribal norms, how those subtribes did and did not work together, how they worked or did not work together with adjacent tribes. So we focused it truly on being able to paint the appropriate human landscape so we could operate within.

Having said that, most of the governors are not from the provinces that they operate within. So these output products were incredibly beneficial for them as well so they could create proper access. We found it really unique that as a matter of fact the Paktia governor was from a different tribe, and he had great difficulty engaging his tribal leaders at the lower district and the village level. He was using his own procedures and techniques that he had used in the tribe that he came from.

Well, we were coaching him collectively on, hey look, it ain't working what you are doing. The products that came out from the human terrain team were those products that we used to help him understand that community that he was trying to engage and discuss and deal with. That is how we applied it.

Mr. KLINE. So that tool is not only helpful to you and your soldiers for understanding the human terrain that they are navigating through, but you are actually able to turn it around and help an Afghani leader use it as well. But it doesn't address the

problem and couldn't of just corruption, low character, or something like that that might be in place.

Colonel SCHWEITZER. You can't help but get back information from the village leaders, the tribal leaders, the mullahs, when corruption is out there, when they think governance is not working on behalf of them. That does come. It is an output product. It is not the primary product, but it certainly is additional information that comes back.

So you do get this kaleidoscope of responses and data points to be able to put into the kitbag to figure out, okay, how do we reduce this friction? How do we create this access? How do we then coach the governors, the police chiefs, the army chiefs, to have better behavior or proper behavior as expected by that community and give them ultimate options? At first there is just one option—the same thing it does for us.

So what I alluded to earlier was that these teams, the products that they are creating, they benefited the Afghan national security forces as much, if not more, than the coalition forces. To our moms and dads that are out there, that are providing their sons and daughters to go into uniform, they can rest assured that is saving lives.

In terms of the mission, it has a significant impact with developing governance within the Afghan structure, of enhancing economic development, as well as developing the Afghan national security forces.

Mr. KLINE. Thank you very much.

I yield back, Mr. Chairman.

Mr. SMITH. Thank you.

Ms. Gillibrand.

Mrs. GILLIBRAND. Thank you, Mr. Chairman.

Thank you all for your testimony and your work and your service. It really sounds like you have developed a program that is extraordinarily value-added.

I want to ask Colonel Schweitzer, in your prepared remarks and through your stated remarks, you went through all the advantages that you have seen both on the ground with our own troops, with reducing violence, with working better with the local governments. I just want a little more context about how are our men and women on the ground who are doing this work perceived.

Colonel SCHWEITZER. You mean the human terrain teams, how they are perceived? I guess the best way to judge that is the access that they are and are not granted. Do I think that every engagement that the human terrain teams have had has been one of success? I am sure that is not the case. I am sure that there have been times that either it has stumbled or that a community has just not been willing to accept it because at the end of the day, it still is a foreigner on the other end of the discussion.

So there are going to be those challenges that are out there. But what I have found is that through time, if we don't use a Western watch that I alluded to earlier, and if we allow the Afghan condition set to be achieved, that that access has never not been achieved. That is just due to constant engagement, consistent performance, constant behavior on both sides of the equation, so they

can develop enough of a trust where they are willing to open up and discuss.

But simply stated, we have never—I cannot recall a single incidence where they did not gain access eventually. But I can tell you numerous times where we didn't gain it immediately. Again, that is because we did default to our Western watch that we quickly threw away so we could focus on getting the right conditions set to establish the necessary trust that allowed the communication flow.

Mrs. GILLIBRAND. Have you considered, or is there already coordination with United States Agency for International Development (USAID), with Central Intelligence Agency (CIA), with the State Department? It seems to me that if you look at other areas where we are not combat-focused, but more population-focused and intelligence-gathering-focused, that this kind of information would be extremely valuable in other applications of the U.S. government's role.

I am thinking of different applications, but looking at Pakistan for example. When I was there last summer, we have certain missions there—intelligence missions, USAID missions. There are enormous amounts of efforts that go on there. I am wondering, is this something that you would like to see expanded that it could be used in coordination with the other agencies so that everyone has the benefit of this very valuable cultural and ethnic information that could inform their operations and their missions to be more successful?

Colonel SCHWEITZER. Ma'am, that is probably a bit outside of my own personal scope, but I am pretty confident that this is not mutually exclusive to what we did in the last 15 months. I clearly can see the benefits as it could apply to different organizations and agencies to enable them to properly engage with communities.

That is probably about as far as I can go with it, not because I don't want to go more, I am just not privy enough to the other agencies' missions. I do not believe that it is mutually exclusive to just what we were doing.

Mrs. GILLIBRAND. Do any of the other panelists have any view on that? Do you have any knowledge of those subjects? Okay.

Let me ask Dr. Van Tilborg something. This training obviously is much more than just the do's and don'ts of a given society. I am thinking that we have sensitivity training that we give our troops before they go into combat. Often they are deployed to Iraq, then Afghanistan, then some other location. Is this something that we can expand so that all of the men and women that we train for missions, particularly in Iraq and Afghanistan, will have the benefit of this kind of in-depth cultural knowledge?

Dr. VAN TILBORG. Thank you for the question.

I think it is up to our actual men and women in uniform to decide precisely what they need at each echelon level in the operating forces. But I think that probably every man and woman who goes over does need to have some sort of basic understanding of these kinds of cultural, social, religious, economic, political, et cetera, kinds of issues.

I think that that level of training is quickly dawning on the military, the need for doing that. I think the Marine Corps probably

has picked up on this the quickest. My understanding is their facility down at Quantico called the Center for Advanced Operational Culture Learning (CAOCL)—I don't remember what it stands for, but the "C" in it is for "cultural" learning—is running lots of young Marines through so that they have an understanding that is meaningful.

We are not talking here about a travelers tourist guidebook. This is information that needs to be of a different nature. Not everyone needs the same level of training. There are people who have special jobs that require very deep understanding, including language training, and others who can do a good job in what they are assigned with a lesser degree of training.

Mr. SMITH. Thank you.

Mr. McIntyre is next.

Mr. MCINTYRE. Thank you, Mr. Chairman.

Thank you, gentlemen, for being with us today.

Colonel, as one of those who represents Fort Bragg, let me state to you how proud we are of your service and your commitment and all that you do with the 82nd Airborne.

I just simply wanted to ask, given the testimony and the questions that have already been asked, the concern of how what you were doing may tie into the concern we hear over and over with regard to progress both in Afghanistan and, for that matter, in Iraq as well, about the situation involving the local police.

I notice in your testimony on page five at the top you state that the true power brokers in the area were the mullahs, not the village elders, who were mostly Taliban supporters in a certain situation you were describing there. Later in your next paragraph, you talk about the net effect of moving from 19 of 86 formal districts that supported the government, and today you assess 72 of those districts as supporting the government. You attribute that change, or at least some of that change, to HTT.

Is this an area that can or is working with regard to helping an understanding and a respect and a need for the work of the local police to be successful? When I was in Afghanistan and talked to Dan McNeil, our friend who as you know has served from Fort Bragg for many years, that continued to be a concern—the situation with the local police. We have also heard that from other panels that have some before us.

Colonel SCHWEITZER. Sir, I think one of the overarching problems is corruption. So whether that is corruption within the Afghan national police or the governmental structure, no matter where it is, it is damaging because once you create a separation from the enemy, and you then get government to come down there to their community—government being represented by police, army, actual government employees—who then skim off the top or do not provide for the community, you then cause that community to say forget government, I am going to turn back toward the Taliban.

The human terrain teams help us at the front end of this piece with gaining the appropriate access and providing us alternate options and courses of action to be able to conduct appropriate engagements so we can, (A), link in those security forces or those government representatives with their people. If the government struc-

ture or the government representatives then are corrupt, that is a significant step back. That has happened.

Frankly, in the remaining 14 districts, four of them are going to real hard nuts to crack because that happened on a continual basis. We had a pretty good understanding of the human terrain, a pretty good understanding of the human dimension, the cultural expectations. And then we had governors or sub-district governors make poor choices that resulted in those communities hardening against their government. So that is a different part of the problem, but in my opinion it is one of the underpinnings that we have to continually work at.

Again, though, the human terrain teams enable us to get access and re-get access. And here is the other thing, sir, that was helpful, is when we did get these communities that were troubled, the human terrain teams helped us understand that human dimension even better because that is the last place that we need to go shoot, the last place.

When you have that kind of a problem, that kind of an attitudinal opposition to the government structure, going in there with force in Afghanistan is the wrong answer. You have to go in there with a better idea. You have to go in there with better performance. And you have to be able to access those communities, those villages, those tribal leaders, and show them that their government can and will provide for them in a manner that is based on integrity. So they have been critical with us getting into the hard places.

Mr. MCINTYRE. Thank you for the excellent answer. If I can just clarify, so in places like those 14 remaining districts that you said are going to be pretty hard situations to deal with, is there a concentrated effort to coordinate the HTT with those that can influence to try to crack those hard nuts, as you said?

Colonel SCHWEITZER. Yes, sir. Here is the other dynamic that is occurring in Afghanistan. I subordinated my brigade to the 203rd Corps commander, Major General Khaliq. He has built a campaign plan. I just hearken back to five years ago when they said they couldn't have a government because they didn't have the human capital. They couldn't have an army because they didn't have the human capital.

And now here today, four and a half years later, Major General Khaliq is developing a campaign plan that we are in phase two of, of cleaning out the provinces that he is responsible for and getting government down there to their people. Sir, he is the one who has set the table. So these products that came from the human terrain team went into their effects-cell because they have a mirrored effect-sell that our headquarters has, that went into their campaign planning. So they have a strategy to get out to all 14 districts. Their next of operations are occurring today, and started about a week ago in one of those real hardened areas.

Mr. MCINTYRE. Thank you.

Thank you, Mr. Chairman.

Mr. SMITH. Thank you.

Mr. Thornberry.

STATEMENT OF HON. MAC THORNBERRY, A REPRESENTATIVE FROM TEXAS, RANKING MEMBER, TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES SUBCOMMITTEE

Mr. THORNBERRY. Thank you, Mr. Chairman.

Dr. Van Tilborg, I am wondering if we put the same rigor in behavioral and social science research as we put into other areas of research, with things like metrics and what-not. Part of the reason I wonder is that I recently read a book by a psychologist who tried to explore why people turn to terrorism. And then there has been a considerable amount of controversy about that book regarding his methods and the conclusions that he reaches based on those methods.

It seems to me just inherently more difficult to have objective metrics and other standards for this area of research as physics or chemistry or something. How does that shake out?

Dr. VAN TILBORG. Congressman, I would certainly have to agree with you, but of course I am not a researcher in this domain. Professor Segal might be able to say that the metrics are in fact extremely rigorous. In my experience, it kind of depends on the specific let's say social science that you are examining. If you are in a situation where you can examine, say, the reaction of an individual who is now tapping with a pen and you are able to make numerical measurements regarding that individual's reactions or behavior, I think you wind up with the kinds of traditional metrics that we use in other branches of science.

In other areas, for example also in language training and language understanding, I believe that you can do relatively conventional kinds of testing in simulation-types of environments. But then there are other areas where, I agree with you, it is very difficult. I think fundamentally it is difficult because it is not that easy to run controlled experiments in some aspects of the social sciences.

For example, in the case of the human terrain teams that Colonel Schweitzer has been explaining so well, you can't really do the controlled experiment of a particular scenario with a HTT, and then run that same scenario without the human terrain team and be able to say, well, you see in one example we had nine casualties, and in the other we had three, so that is the difference by having the human terrain system.

I believe that is probably a fundamental difficulty in this business. However, I would say that in a sense there is no less rigor in this field. They get as much rigor out of it as they can, in my view.

Mr. THORNBERRY. Well, a fair point. It just strikes me that when you are talking about people's motivations and policy is based upon an assumption of those motivations, it is somewhat murky territory.

Dr. Segal, I would be interested in your comments on this. Let me throw out one other aspect of it. I was recently on a commission that recommended that our nation take greater advantage of immigrant and expatriate communities in the United States to help aid our understanding in other nations, other cultures, and especially other motivations, which is not so easy to study.

Are we doing that? Do you agree we need to do that? How would we? And then in terms of the research that goes on, how do we tell whether it is good enough to make a policy decision on?

Dr. SEGAL. Thank you for those questions.

I will certainly agree it is very difficult to be rigorous in the social sciences I would argue because the systems that we study are so complex. I tell my colleagues at the University of Maryland that God must have loved the physicists; He gave them all the simple questions. But when you start looking at complex individuals in complex social systems, and you have a very, very difficult task.

So I would say that for that element of the social sciences that is in fact oriented toward measurement and rigor, those of us who are influenced by positivism, we do the best we can. But as Dr. Van Tilborg said, we are dealing with situations where you can't bring things into a laboratory and hold variables constant. You have to figure out what to do.

It is kind of like astronomers studying the universe. It is out there, but we can't bring it into the lab. We can still measure elements of it. We are not sure we know everything about it that we need to know. We are not sure we know what we need to measure, but we try. The experimental model doesn't fit.

In terms of whether we should take advantage of immigrant communities to learn from them, I have argued repeatedly—my business is primarily military manpower—and I have argued that in the military, we take less advantage of immigrants in the country than we could in terms of recruitment, which would help not only in terms of numbers, but in terms of a way of building cultural sensitivity and recognition of cultural diversity into the force.

I think on a national level, we could do a better job of that. We have historically been a nation of immigrants. We have enriched our country because of the human capital brought in from other countries. There is a kind of pendulum swing against that right now in the country, I think, and it is unfortunate.

Mr. THORNBERRY. Could I ask, Dr. Weiss, do you have any comments on this—on how you know whether the science is good enough?

Dr. WEISS. In regards to the rigor of science, yes, I would certainly agree with my colleagues here that studying human behavior can be very problematic, much more complicated than studying the movement of atoms at times. However, I would also stress that we are now seeing the incorporation of new technologies and new ways of thinking about human behavior that are allowing us to provide added levels of rigor that improve our understanding of basic human behavior.

Just as one quick for instance, the use of functional magnetic resonance imaging to really get a literal picture of what is going on inside a human skull as somebody is undertaking a particular task. So we are getting more and more adept.

Mr. THORNBERRY. Thank you.

Thank you all.

Mr. SMITH. Thank you very much.

I just had a couple more questions. I want to follow up a little bit on that last question as far as the rigor of these particular social sciences. First of all, in terms of Colonel Schweitzer's experi-

ences, when you go in to specific cultures, you can get reasonably specific answers in terms of the norms and mores of that culture that are very helpful. It is not a guarantee. I am sure not every Afghan in a given village adheres strictly to those cultures and mores, but it is probably a pretty high percentage.

My second comment is that really what you are dealing with here is percentages. As understand a broader population in a given area, you can say 80 percent of the time we think this person will react that way, and they probably will. That is different than in physics where 100 percent of the time when I drop the rock, it is going to hit the ground, but that is still incredibly valuable.

I will throw a basketball analogy out there. If you are picking who to put on the line, you pick the guy who shoots 80 percent instead of the guy who shoots 50 percent. It is not a guarantee. Maybe the guy who shoots 50 percent happens to hit those two free throws and the other guy doesn't, but it significantly ups your odds of success. That is why I think these social sciences are very, very valuable.

I did want to give Dr. Weiss the opportunity to answer the question that Mr. Lipinski raised earlier about how the National Science Foundation and the broader scientific community reacts to sort of, if you will—I will be a little bit more blunt than Mr. Lipinski—being dragged into the military world, and if there is any push-back on that, or if you see that as an incredibly valuable part of what you are doing, or is there more controversy within either NSF or the broader scientific community.

Dr. WEISS. Well, within NSF, I do not see a sense of being dragged into anything. NSF, as has been mentioned, supports basic scientific research. What we have found over time is that we receive unsolicited proposals to conduct research, some of which has clear and obvious applicability to military settings, as I alluded to in my oral presentation.

Other research that we fund does not necessarily have any obvious application, but as the research develops and as the implications of the research evolve, what we find is that much of the research that for instance might have to do with the way that organizations are structured, may have ultimately very clear applications in a military setting.

We have on occasion been involved in collaborative work with the Department of Defense. For instance, last year we collaborated with them on a solicitation, the topic of which was the detection of explosive threats, that was initially going to be targeted at the math and physics communities, but indeed the social, behavioral, economic sciences became part of that, and indeed several awards were made which deal with aspects of the psychology detecting mal-intent.

Mr. SMITH. Who is going to plant the bomb? I mean, if you look into a community, it is part of the counter-IED approach. Instead of just focusing on the explosives, focus on the people, and if you find them, it is as effective as finding the bomb.

Dr. WEISS. Absolutely. Technology is wonderful or can be, but the fact is that technology is used within a human context and you have to understand the human context as well.

Mr. SMITH. So just one more question for Colonel Schweitzer. That was on the role of our special operators that is in the jurisdiction of our subcommittee and we spend a lot of time focusing on it. They have some training in this area. Certainly in irregular warfare and counterinsurgency, part of it is cultural awareness. They have training within that.

I was wondering how their efforts, since they are such a large presence in Afghanistan, and their sort of cultural training, meshes with the HTTs. How short are they of what the HTTs have and how do the two work together?

Colonel SCHWEITZER. Yes, sir. That is a great question, because I think that may be some of the confusion. It is not the same. The cultural training that our special forces get is similar to the same training that the conventional forces get with respect to cultural understanding and being able to grow the capacity of the individual soldier, his understanding of the cultures, the norms, and the communities and their concerns, and what the friction points are.

What the human terrain teams do is they create access. What the human terrain teams do is they help us operationalize their values and norms so we can properly maneuver within them. I would argue, and I can't speak for the special operations community, but as they did operations in coordination with us, they absolutely leaned and relied on the products that the human terrain team produced.

Mr. SMITH. Right. Thank you. That is all I have.

Mr. Conaway.

Mr. CONAWAY. If I might, Dr. Weiss, do you study the transition that ultimately winds up? We have very poor phraseology in terms of describing these folks, but describe the violent radical jihadist, the mindset that leads a person to strap something on themselves and walk into this room and blow themselves up. That person didn't start life with that being their goal, I don't think. Maybe they did.

Do you look at, or is there someone at NSF as a part of this cognitive looking at that transition and how those folks go from—again poor phraseology—moderates to fundamentalists to radical jihadists? How does that transition occur? If it occurs in poverty circumstances, like in Palestine where there is no hope, no future, I can get my head around that. But looking at what occurred in England and other places where folks who were raised in a society where they were educated and had opportunities and had futures, and even doctors involved in this conduct, do you guys look at that issue?

Dr. WEISS. Yes, we do. In fact, we have supported a number of researchers who are interested in exactly the sort of question that you are asking. To jump back to the point I was making earlier, sometimes the insights that we gain into the question that you are asking come from a source that you might not have imagined to begin with.

For instance, there are researchers at the University of Michigan who are interested in exactly the question you are asking, and are asking it in terms of what values within a society are, (A), sacred and therefore not negotiable; and what happens when we try to ne-

gotiate what they consider to be a sacred value. In fact, that results in increased radicalization.

Now, the point in part is that that rose out of basic research that actually was initiated in Mexico talking to farmers about their view of their local ecology. From that basic research, these researchers were able to transition and apply their knowledge in a whole new setting, the one that you are asking about.

We have supported, funded research by other investigators looking at the question of whether it is poverty that breeds radicalization. Not intuitively, the answer is it seems not. In fact, as you mentioned, it is often individuals who may have at one point been at a poverty level, but have risen, and now have the freedom to act further on their radical ideas. So to some degree, it is not the poverty itself. It is the opening up, the availability of resources that liberates them to undertake these actions.

Mr. CONAWAY. As that research progresses, will we reach a point where we can apply that to stop this radicalization? The other question would be, are your researchers Muslims? Because I don't know that I, as a Christian, can have any real positive impact on that progression in the stream. It seems to me that this has to be fellow Muslims or Islamists who have to figure out a way to stop that conversion from fundamentalist to radicals. Is there something you could actually do with the research that you are coming up with?

Dr. WEISS. Well, let me highlight a different undertaking that the National Science Foundation provides funding for. That is the World Values Survey. This is a global survey of attitudes. We, as well as a number of other nations, provide funds to gather these data. Researchers within the United States at Eastern Michigan University, who I believe are of Middle-Eastern background, in fact just last week were in Egypt at an international convention or symposium to discuss their findings regarding attitudes among Iraqis in this particular case, and how the data from the surveys could be interpreted to help mitigate the problems in the Middle East.

Mr. CONAWAY. Thank you, Mr. Chairman.

Mr. SMITH. Thank you.

Mr. Baird.

Mr. BAIRD. I again appreciate all your testimony.

Dr. Weiss, just very briefly, I just want to thank you for acknowledging the people who step forward to help you with this. I know that in the academic literature there was some debate about whether it was appropriate for academicians to be helping the military, and there was actually some criticism about that which I found rather frustrating.

I wish the folks who criticize those academicians could hear your testimony and hear that they were saving lives, not just U.S. lives, but coalition lives and soldiers on the ground, and civilians to a large number. So thank you for acknowledging them and for that recognition. And thanks to them on behalf of this committee.

Dr. Weiss, one of the things that I have been particularly focused on as the chair of our subcommittee has been grand challenges in the social sciences. You could look at those such as energy, health care, national security. One of the questions as I look at research that we fund through NSF is a notion that they call path-to-impact.

Your comparable agency down in New Zealand refers to it as path-to-impact.

So someone proposes to NSF that this is the research we want to do. The question is I think on the minds sometimes of this committee and sometimes of the Congress is if we are spending taxpayer dollars on research, where is the path-to-impact? I know there is this balance between basic research, but somewhere in the general public—the loggers, the fishermen, the steelworkers, the nurses, whoever is working for their living, wanting to get the money out—they want to know what the path-to-impact is.

How do you relate that to the testimony we have heard today and the challenges we face in national security?

Dr. WEISS. Well, as mentioned, the National Science Foundation funds basic research. But we judge the proposals on two primary criteria. Those are the scientific merit, as well as what we call the broader impacts. The path-to-impact would be an alternative. All proposals are judged on both those criteria.

Now, granted that in some cases the impacts may not be obvious at first, but what we have often found is that 10 years down the road, there may be a payoff that was never anticipated. But there can also be impacts that revolve around the basics of the research. Those are training future generations, research on areas that may not have any obvious immediate payoff, but which intrigue people and as a result improve scientific literacy in our public.

We do understand what you are saying, however, and we have made a concerted effort of late to ensure that the titles of research projects cut to the importance of it, that the abstracts of the awarded research demonstrates why the research does have the potential for an impact. So we are very sensitive to the point that you are raising.

Mr. BAIRD. I appreciate that very much.

Dr. Segal, one final question is, you know, you have done some really remarkable work. I appreciated reading your testimony and the topics you and your graduate students and others have studied. One of the intriguing questions—and Chairman Smith and I were just discussing it briefly—so many of these cultures and the environments we are operating in have just had generations now of horrific conflict, Afghanistan, Iraq, Darfur. It is not just that we are no longer in just the sort of symmetric warfare, but the cultures we are in, the people have been through hell, literally. Do we have some insights into how that is affecting people and how that can change the human terrain as it were?

Dr. SEGAL. I certainly can't speak to changes in the human brain. That is for a physiologist, but the terrain, okay.

Mr. BAIRD. The kind of thing that Colonel Schweitzer referred to.

Dr. SEGAL. Sorry. Clearly, we know that exposure to conflict has an impact on people. One doesn't have to be in an area of the world where conflict has been going on for generations. We can see it in the soldiers that we have coming back from Afghanistan and Iraq. Where it has become part of the social fabric, there is every reason to believe—and I am here talking about probabilities; this is not an area where we have rigorous measurement—that it will take a long time to get over it.

We are not talking about well, gee, we can improve the situation in Iraq or Afghanistan within a few years, and then everything will be fine. You really have a generation of people on the ground who have grown up in that environment. It is very possible that that generation will have to pass on, and another generation that grows up in a different environment comes to power in that area, to really begin to see the long-term consequences.

Mr. BAIRD. One final comment, and it would be just that our country has invested many, many billions of dollars in mapping the physical terrain. The Global Positioning System (GPS) systems which we now find in our automobiles were based on the recognition that it is foolhardy to send our military forces into a world in which they don't know the terrain. You are endangering the soldiers, you are endangering the civilians, you are endangering the success of the mission.

What I find so encouraging and interesting and challenging about today's hearing is the recognition that that human terrain, which we may not be able to map from a satellite or trace with the GPS, may be absolutely as important to the success of the mission and the survival of our soldiers and the people we are trying to serve.

Thank you for your testimony and your work.

I thank the chair for holding this hearing.

Mr. SMITH. Thank you.

I will close simply by agreeing with everything Mr. Baird just said. I think that was the purpose of this hearing. I think it was very, very informative. We look forward to finding ways within both of our committees to be helpful to what all of you are working on.

I thank you for your testimony today.

We are adjourned.

[Whereupon, at 10:44 p.m., the subcommittees were adjourned.]

A P P E N D I X

April 24, 2008

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

April 24, 2008

Statement of Terrorism, Unconventional Threats and Capabilities Subcommittee Chairman Adam Smith Joint Hearing with the Science and Technology Committee Research and Science Education Subcommittee on the Role of Social and Behavioral Sciences in National Security

April 24, 2008

"Good morning. I'm pleased to chair this joint hearing with my Washington state colleague, Rep. Brian Baird, to talk about the Role of Social and Behavior Sciences in National Security. I want to thank our distinguished panel for their time and expertise and I look forward to hearing from each of you.

"The fight to stop the spread of terrorism is in large part a struggle to understand and work with local populations. Our special operations forces and other military and civilian personnel work in dozens of countries and across many different cultures, and understanding the particulars of each is of enormous importance if we are to deny al-Qaida and other groups save haven. These interactions are a big component of American 'soft power,' and the more skilled and informed we become in this context, the better we will be able to root out insurgencies and terrorists.

"Understanding both our enemies and the local population is crucial if we are to gain more traction against al-Qaida. Often, our military engagement in the Muslim world and our lack of understanding of various Muslim cultures leads to miscues and miscommunications that feed the propaganda machines of our enemies. We have not effectively countered their key messages, in part because we lack solid understanding of local populations that would allow us to take a less militarized approach to our interactions, and prevent conflict before it arises.

"Our subcommittees hope to learn from our panel today of the potential offered by social and behavioral sciences for improving our understanding of our enemies and their local contexts so that we can increasingly deny terrorists the base of support and the freedom to operate in a given region. In addition, we'd like to hear from the panel their thoughts as to how we coordinate and leverage investments in social and behavioral sciences across government agencies. Overall, I hope to learn more from you about how we use our investments in social and behavioral sciences to improve our approach to national security.

"I want to thank the panel for their time, and again thank Chairman Baird for working with us to hold this hearing, as well as the ranking members of our respective subcommittees."

Rep. Brian Baird (D-WA)

Chairman, Subcommittee on Research & Science Education
House Committee on Science and Technology

Joint Subcommittee Hearing with Armed Services Subcommittee on Terrorism, Unconventional Threats and Capabilities:

Role of the Social and Behavioral Sciences in National Security

Good morning. First, I want to thank my colleagues Chairman Smith and Ranking Member Thornberry and their staff for working with me and Dr. Ehlers and our staff to bring together our two committees for this hearing.

There are few greater challenges facing our country than national security. While technology has and will continue to improve our ability to meet that challenge head-on, our successes and failures at all scales are largely driven by people, not technology.

Exactly one year ago, I found myself on the Floor of this House defending the National Science Foundation's merit review system and specifically its research portfolio in the social and behavioral sciences from specious attacks. Unfortunately some of my colleagues failed to do their homework that day. One of the grants they chose to single out has been cited by the U.S. Army Research Institute as crucial in helping to train our soldiers currently stationed in the Middle East. The title of the grant was "The Accuracy in the Cross-Cultural Understanding of Others' Emotions." This research, currently being carried out with NSF funds, is directly relevant to understanding and predicting behavior, detecting deception and improving relations within numerous national security settings – not just the soldiers in the field.

In fact the National Science Foundation supports basic research across the social and behavioral sciences that could have near- or longer-term application to our national security needs, even if the terms "national security" or "Iraq" or "military" never show up in the grant titles. Similarly, the Department of Defense supports some of its own, typically more application-driven social and behavioral science research. I believe that there is a real opportunity for increased collaboration between these two agencies in support of research that meets both of their criteria and advances both of their missions.

I am happy to be working with my colleagues on the Armed Services Committee to provide a forum for discussion about mechanisms for such collaboration. I also look forward to learning more from our witnesses about the full range of relevant social and behavioral science research needs and how such research

can be translated into practice to strengthen our national security. I thank all of the witnesses for being here this morning.

HOLD UNTIL RELEASED
BY THE COMMITTEE

STATEMENT TESTIMONY OF

DR. ANDRÉ VAN TILBORG
DEPUTY UNDER SECRETARY OF DEFENSE
(SCIENCE AND TECHNOLOGY)

BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES

COMMITTEE ON ARMED SERVICES
SUBCOMMITTEE ON TERRORISM, UNCONVENTIONAL THREATS AND CAPABILITIES

AND

COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

April 24, 2008

Mr. Chairmen, distinguished members of the Subcommittees, thank you for this opportunity to appear before you to discuss the Department's science and technology (S&T) challenges and investments in the social sciences. I will use this opportunity to describe the Department's past investments and their impact on our forces, as well as the current operational challenges and the underlying science base and technological advances that can help the Department to meet these challenges. I am also pleased to have the chance to highlight one of the new initiatives the Department is undertaking in the area of socio-cultural understanding and modeling. These efforts specifically address work in areas related to Irregular Warfare and the Global War on Terror (GWOT).

I have organized this testimony into three sections, the first section deals with the historical role of the social sciences in the Department, the second section will focus on how the social sciences can support the Department with the unique challenges that arise in non-traditional or irregular warfare, and the last section will highlight the coordination and collaboration within the social sciences across the Department of Defense (DoD) and government agencies.

Historical Contribution of Social Sciences to the Department of Defense and National Security

The social and behavioral sciences encompass several disciplines most people are familiar with, including psychology, sociology, anthropology, economics, history, and political science. They also encompass some disciplines that are not as familiar, such as human factors, computational social science, and linguistics. The common goal of these

disciplines is to develop a better understanding of human beings at every level, and to understand the behavior of an individual as well as the forces that shift the beliefs of an entire society. They seek to understand the functioning of individual minds as well as the dynamics of a society's recovery from a horrendous natural disaster. The social sciences are often called 'soft' sciences, which is meant to somehow differentiate them from the 'hard' sciences such as physics and chemistry. Designating a scientific field as being soft gives the listener a not so subtle hint that there is an absence of scientific or empirical rigor in the field, or that the science is not mature enough to have any practical value. However, this is far from the case with the social sciences. The social sciences are based in theories that are empirically tested, and the questions that the social and behavioral sciences try to answer are in some ways harder and more difficult than the physical sciences. It is arguably easier to predict the motion of a single neutrino or muon than to predict how a video posted on YouTube can propagate through a social network and the on-line media to reshape a national debate and change policy. It is easier to identify the existence of a new planet by studying wavelength shifts of distant stars than it is to predict which individual in a society will turn from a political activist to a violent extremist. The social sciences try to understand behavior, what factors influence current and future human behavior, and how the human-to-human and human-to-environment interactions can change outcomes.

The core of the Department and its ability to perform its role in National Security is its people, i.e., the military, civilian and contractor workforce. Warfighting platforms are tools that require a skilled and well trained workforce to operate. In the past the

Department's military and civilian personnel's readiness has always been the difference between victory and defeat, and there is no reason to believe the future will be any different.

Social Science Research in Defense: World War I

The social sciences have had a long history in the formation and shaping of the force structure of the Department of Defense. Prior to World War I, there was no formalized relationship between the social science research community and the Department. During World War I, many psychological science pioneers such as Robert Yerkes worked for the government to develop personnel selection tests and classification systems to meet the surge in demand for forces and to screen the over 1 million recruits that came through the front door. They developed the U.S. Army selection tests to screen all applicants, and there was preliminary work done to screen applicants from more technically challenging fields such as aviation. Their work, in what today would be called the field of psychometrics, saved substantial amounts in training costs, and likely many lives through better matching of recruit skills to job requirements. At the end of the war, the social scientists went home, but their personnel selection tools continued to provide value to the manpower, personnel and training processes in the Department. This research area continues to be explored today by the U.S. Army Research Institute (ARI) and the U.S. Navy Personnel Research, Studies and Technology (NPRST) Laboratory.

Social Science Research in Defense: World War II to Present

During World War II, the contributions of the social sciences were expanded beyond their prior applications in personnel selection. There was a rapid increase in the need for large numbers of forces in specific fields (e.g., pilots, sonar operators, and engineers) and a surge in the rate at which technologies were developed and integrated into warfighting platforms. For comparison, in 1939, within the United States only 6,000 aircraft were built per year. However, by 1944 over 9,000 aircraft were being delivered to our forces every month. It was not uncommon for the cockpit systems and design of an aircraft coming off the same assembly line to change on a monthly basis. The surge in the need for an educated and more technically skilled workforce led to advances to the development of performance based selection tools for fields such as aviation. It also led to more advanced training systems that were the precursors to today's advanced training simulators, and the development of systems to familiarize aviators on the ground with spatial disorientation and climatic conditions that can prove fatal in flight. With these advancements, the attrition rate of aviation cadets, which ran as high as 70% at the beginning of the war, was cut in half.

The technological advances during WWII were also most evident in the field of aviation. The changes in cockpit design and the increased capabilities of the new aircraft highlighted the need for consistency in design, or at the very least designs that were congruent with human proclivities and expectations. This led to the birth, within the Department, of the field of Human Factors. Human Factors is focused on optimizing the

human-machine interface and interaction. Early on this meant using known human perceptual and cognitive abilities to make the cockpit easier and safer for the aircrew through the use of color, lighting, and control and display designs and location. Today the field of Human Factors employs over 12,000 practitioners nationally who are responsible for designing a wide variety of commercial and government products for improved usability and safety.

Following World War II, the Army, Navy and Air Force created research laboratories that were specifically devoted to social science research and human factors. The work done at these laboratories was still focused on the manpower and personnel area, the field of Human Factors, and on finding ways to reduce the increasing costs of training our combat forces. Advances in our understanding of human cognition and learning have had a tremendous impact on how the Department trains its force, and how it plans and executes its missions. The social sciences contributed heavily to the application of simulation technologies to prepare and train our forces for potential scenarios and missions. Today, thanks to pioneering work done by the Air Force Research Laboratory, the Naval Air Warfare Center – Training Systems Division, the Army Research Institute for the Behavioral and Social Sciences, and others, aircraft simulators in Florida can link with ships in port in Norfolk and train for a joint mission with actual aircraft flying over Nellis Air Force Base in Nevada. Other applications of social science research have been in the development of decision support tools and decision aids that support operational planning, and command and control.

Currently, the various activities within the Department employ social scientists, both uniformed and civilian, as well as funding contract social scientists who support the Department in the areas of individual and team training, leadership development, organizational research, cognitive systems and interface design, personnel protection, and technologies to support training simulation (performance measurement, after-action review, human behavior representation). Most of this work is executed at the Service level and is overseen at the Office of the Secretary of Defense level by the Director, Defense Research and Engineering (DDR&E), and is coordinated through the Department's Reliance 21 process. The S&T challenges in this field are in the areas of unmanned vehicle control, performance in network-enabled environments, whole-person (cognitive, mental, emotional) assessment for recruitment, improving decision making under stress and in complex environments, human-robot interactions, adaptive automation, team performance, cultural awareness training, embedded training, the use of gaming technology for training and mission rehearsal.

Current Efforts and the Global War on Terror

Social science continues to contribute to DoD capabilities in the manpower and personnel and human factors arenas. Independent of the threat to our national security, there is still the need to bring in the best quality recruits and to match their skills to the right job, and there is still the need to design systems that optimize the ability of our forces to use those systems in wartime. However, the GWOT, and, more generically,

Irregular Warfare (IW) have added additional roles for our Soldiers, Sailors, Airmen, and Marines. They now must be able to plan and operate effectively in settings where they must have the skills to work in novel, culturally complex situations while supporting non-combat, non-kinetic operations. They find themselves in a more dynamic human-centered environment in which they must adapt to changing conditions and more fully understand human nature, and foreign cultures and societies. The social sciences can, at the very least, inform, if not prepare, our forces for these kinds of environments.

The need for improved cultural awareness training was identified in the early phases of Operation Iraqi Freedom. It was realized that the general purpose forces needed some of the same cultural awareness competency that our Special Operations Forces have traditionally maintained. Military operations in complex, multicultural environments require more than just being culturally sensitive to the dos and don'ts of a society. They require an awareness and knowledge that can be applied to improve interactions and shape the outcome of the interactions. Each of the Services have established cultural awareness training centers that are developing content, sharing this content, and have begun training their personnel on the specific knowledge necessary to support their military missions. In addition, cultural training is ongoing at the Service Academies, and is provided to forces prior to deployment. The cultural awareness training centers have been developing their content from the extensive on-the-ground experiences of the Soldiers and Marines returning from Iraq, combined with the relatively well known academic knowledge of Iraq's religious and sectarian history. Providing the same level of 'understanding' and training for data-poor, less studied socio-cultural

environments, such as the mountainous tribal regions of Afghanistan or the multicultural regions of Indonesia, for example, is much more difficult. The Army Research Institute is funding research into understanding the foundations of culture skills and competencies that can be used across deployments and geographic assignments. Also, the Department has begun to develop methods and processes to collect and examine what data are relevant and sufficient to understand a culture, relative to our military missions. The Department is also developing systems that can handle this type of data/models to help plan for non-kinetic operations and to measure the intended and unintended outcomes of these operations. The ultimate goal is to achieve an acceptable baseline for cultural competency across our forces. The first generation capabilities in this area are being derived from the best academic and professional subject matter experts providing schoolhouse content. An example of this type of work is the Combating Terrorism Technology Support Office work to develop training support packages that focus on the operational and tactical applications of cultural awareness, with a specific focus on Indonesia. The next generation capability will likely be computer-mediated training and mission rehearsal in relevant venues. One example of this work is ongoing efforts as part of the Small Business Innovation Research (SBIR) Program that is developing a system that will train how to read Middle Eastern non-verbal cues and develop an understanding of what those cues say about a person's intentions. Another example is the Defense Advanced Research Projects Agency's Tactical Iraqi Language and Culture Training System which uses interactive computer 'avatars' to teach soldiers basic language and cultural understanding. The third generation capability will be embedded within more

immersive, dynamic environments. Work in the area of human behavior representation and agent-based modeling would support this type of capability.

Last year, the DDR&E initiated a program to support Human Social, Culture and Behavior (HSCB) Modeling that can help the Department to understand social and cultural "terrains" as well as the complicated dimensions of human behavior that can lead to peaceful and/or violent intent. The HSCB is focused on developing the required scientific base and will field mature technologies that support human terrain understanding and forecasting across a range of mission areas and geographic regions. It will focus on identified technical gaps in our ability to plan and execute military operations in which socio-cultural issues are a dominant factor. The HSCB effort will work on filling in the gaps in data collection/infrastructure and knowledge management, and then developing the models to forecast societal and cultural behaviors. In addition to delivering software modules that are fully integrated into DoD command and control systems, the HSCB effort will help to create the infrastructure (simulations and content, which includes data, models, and theories) to support tactical through strategic training, mission rehearsal and experimentation using valid cultural entities and models. The output from the HSCB program will improve the Department's ability to plan for stability, security, transition, and reconstruction operations in complex environments. These improvements will occur at the tactical, operational and strategic level, and will enhance the Department's coordination with other agencies (e.g., Department of State) in their efforts to stabilize 'hot spots' around the world. The program has just completed its

initial review of proposals from its first Broad Agency Announcement, and contract awards will be pending.

Interagency Coordination and Collaboration

Even prior to the release of the National Security Presidential Directive (NSPD) – 44, Management of Interagency Efforts Concerning Reconstruction and Stabilization, there were a number of professional and governmental venues through which social science research and policy were shared. A number of professional societies, such as the Human Factors and Ergonomics Society and the American Psychological Association have specific military focused sessions and groups that are heavily attended by government, industry and academic representatives. Internal to the U.S. Government, the National Science and Technology Council (NSTC) established a Subcommittee on the Social, Behavioral and Economic Sciences. This active subcommittee includes representatives from all of the executive branch agencies who represent the social science research and policy portfolios of their respective agencies. Some of the efforts of the subcommittee have focused on identifying common themes and complementary research programs, and on identifying future research needs that span across the agencies. Currently, the NSTC's Committee on National and Homeland Security is in the process of establishing a subcommittee on Human Factors for Homeland and National Security (HFHNS) for interagency cooperation. There are, additionally, project level collaborations between agencies (Department of State and Department of Defense) that

focus on regional stability. Finally, cooperation is even extending to the North Atlantic Treaty Organization Alliance where research groups have been established to share knowledge and expertise on such topics as social science modeling, and terrorism.

Conclusion

In conclusion, social sciences have been a consistent contributor to the Department's mission to support National Security, and the DoD S&T program has provided both core and supporting capabilities that have had an impact on military readiness. The Defense S&T social science investments have adapted to the realities and challenges of the GWOT. The new investments being made today by the Department of Defense will meet these challenges and directly support the training and equipping of tomorrow's force. Thank you for this opportunity to address both subcommittees. The Department truly appreciates the continued support of Congress in providing us the tools and resources to carry out our vital mission.

Statement of
David R. Segal
Professor of Sociology and Director, Center for Research on Military Organization
University of Maryland College Park
To
Subcommittee on Terrorism, Unconventional Threats and Capabilities
House Committee on Armed Services
And
Subcommittee on Research and Science Education
House Committee on Science and Technology
on
The Role of the Social and Behavioral Sciences in National Security

Thursday, April 24, 2008

2118 Rayburn House Office Building

I am honored and pleased to have been invited to testify to you on The Role of the Social and Behavioral Sciences in National Security. I applaud your exploration of opportunities for partnership between the Department of Defense and the National Science Foundation for supporting such research. I believe such a partnership would vastly expand the social science expertise that is brought to bear on matters of American national security.

I have been asked to address four issues.

First, I have been asked to provide an overview of the University of Maryland's Center for Research on Military Organization. The Sociology Department at the University of Maryland is unique in America in that it began teaching courses in military sociology and the sociology of war during World War II, and has done so continuously since then. Military sociology is a relatively small field, and our program is the largest in the nation. In 1995 the research efforts of a number of faculty and graduate students were consolidated in the Center for Research on Military Organization, which was designated a Center of Excellence by the Army Research Institute for the Behavioral and Social Sciences, with the dual missions of conducting cutting-edge research in military sociology, and educating a successor generation of scholars in this field.

Our research program has four primary foci: diversity in the military; military families; military operations; and the intersection of the military and society. Each of these areas has implications for military effectiveness. In the area of diversity we have dealt with issues of gender, race, and sexual orientation. Recent military family research has looked at the financial well-being of military families and the impact of geographic mobility on families. Our research on military operations has dealt with multinational peacekeeping and, more recently, with insurgencies. And our research on the civil-military interface has included studies of youth attitudes and behavior regarding the military, how changes in

American professions and in American organizational processes such as outsourcing have affected the military, and the impact of base closings on host civilian communities.

Our program is currently executed by four faculty members, ten graduate students, and one post-doctoral research fellow. Since 1985 we have granted eighteen Ph.D. degrees to students specializing in military sociology, ten of them since 2000. Table 1 will give you a sense of who these graduates are, the topics of their doctoral dissertations, and what they did after they received their degrees.

Table 1. UNIVERSITY OF MARYLAND MILITARY SOCIOLOGY DOCTORAL DISSERTATIONS COMPLETED, 1985-2007.

Franklin C. Pinch (Ph.D. 1985). Mid-Career Transition and the Military Institution in Canada. Dissertation chair: David R. Segal. Subsequently Director of Military Psychology and Sociology, Canadian Armed Forces, and Adjunct Professor, Carleton University. (Now retired).

Nehama Ella Babin (Ph.D. 1986). The Impact of Military Expenditures on Economic Growth and Development in the Less Developed Countries. Dissertation chair: David R. Segal. Subsequently Senior Research Scientist, U.S. Army Research Institute for the Behavioral and Social Sciences.

Linda Moghadam (Ph.D. 1989). The Reciprocal Nature of Work and the Family: Perception of the Work/Family Interface and its Impact on Army Reenlistment Behavior. Dissertation Chair: Barbara F. Meeker. Subsequently Lecturer on Sociology and Director of the Undergraduate Program, The University of Maryland at College Park.

Robert J. Waldman (Ph.D. 1991). International Peacekeeping: Conditions of Conflict Control. Dissertation chair: David R. Segal. Subsequently federal executive, Federal Emergency Management Agency.

Kathleen M. Paasch (Ph.D. 1992). The Effects of Military Service on Marital Dissolution. Dissertation chair: Jay Teachman.

Doris Briley Durand (Ph.D. 1995). The Role of the Army Wife as Perceived by Male Officers and their Wives: Is it a Commitment to the Two-for-One Career Pattern? Dissertation Chair: Mady W. Segal. Subsequently Research Scientist, Uniformed Services University of the Health Sciences. (now retired).

Xiaolin Li (Ph.D. 1995). Women in the Chinese Military. Dissertation chair: David R. Segal. Subsequently Vice-President, Songbin System International.

Morten G. Ender (Ph.D. 1996). Soldiering on the Information Superhighway: Interpersonal Communication During Military Operations in the Post-Cold War

World. Dissertation chair: David R. Segal. Subsequently Professor of Sociology and Director of the Sociology Program, United States Military Academy.

David Rohall (Ph.D. 2000). The Effects of Financial Situation and Organizational Commitment on the Downsizing Process: A Case Study of the Russian Army. Dissertation Co-Chairs: V. Lee Hamilton and David R. Segal. Subsequently Associate Professor of Sociology, Western Illinois University.

Bradford Booth (Ph.D. 2000). The Impact of Military Presence in Local Labor Markets on Unemployment Rates, Individual Earnings, and Returns to Education. Dissertation chair: David R. Segal. Subsequently Principal, ICF International.

Richard T. Cooney (Ph.D. 2000). Moving with the Military: Race, Class, and Gender Differences in the Employment Consequences of Tied Migration. Dissertation chair: Mady W. Segal. Subsequently Director of Diversity Programs, Office of the Secretary of the Air Force.

Steven S. Trainor (Ph.D. 2004). Differential Effects of Institutional Socialization on Value Orientations in Naval Academy Midshipman. Dissertation chair: David R. Segal. Subsequently Permanent Military Professor of Leadership and Head of the Leadership Department, United States Naval Academy.

Ryan Kelty (Ph.D. 2005). Social Psychological Effects of Integrating Civilians and Military Personnel. Dissertation chair: David R. Segal. Subsequently Assistant Professor of Sociology, United States Military Academy.

Yuko Kurashina (Ph.D. 2005). Peacekeeping Participation and Identity Changes in the Japan Self-Defense Force: Military Service as "Dirty Work". Dissertation chair: David R. Segal. Subsequently Research Associate, University of Maryland.

Meridith H. Thanner (Ph.D. 2006). Community after the Cold War: The Effects of the Closure of Fort Ritchie on Cascade, Maryland. Dissertation Chair: Mady W. Segal. Subsequently Faculty Research Associate, Johns Hopkins University Office of Critical Event Preparedness and Response (CEPAR).

Rachel N. Lipari (Ph.D. 2006). The Financial Well-Being of Military Families. Dissertation chair: Mady W. Segal. Subsequently Research Analyst, Defense Manpower Data Center.

Brian J. Reed (Ph.D. 2006). Social Network Analysis and Counter-Insurgency Operations: The Capture of Saddam Hussein. Dissertation chair: David R. Segal. Subsequently infantry battalion commander, U.S. Army.

Irving Smith (Ph.D. 2007). The Effects of Military Service: Social Status Attainment of World War II Veterans through the Life Cycle. Dissertation chair: David R.

Segal. Subsequently Academy Professor of Sociology, United States Military Academy.

Five of these Ph.D.s have been military officers who were sent to Maryland for graduate education before reporting to our military academies as faculty members. Our alumni, both military and civilian, teach at military academies and civilian institutions, work in the research and development industry and in federal agencies, and command military troops in the field. Among our current students we have two Navy officers who, upon completion of their degrees, will become Permanent Military Professors at the Naval Academy. Next year a field grade Army officer who has been selected for the faculty at the Army War College will begin doctoral studies at Maryland.

In addition, we have in residence fourteen Navy and Marine officers who are enrolled in a Masters program to prepare them for serving as company officers at the U.S. Naval Academy starting next year. This program reflects a partnership between our Center, the Psychology Department, and the School of Education at Maryland, and the Naval Academy. West Point has a similar program through Columbia University, and the Air Force Academy has one through the University of Colorado. These programs are not research-oriented programs, but they do serve to educate the officers who will be mentoring the current generation of cadets and midshipmen about the contributions of the behavioral and social sciences to national security.

Over the last decade, our research, excluding our contract with the Naval Academy (which is for education, not research), has been supported by over four million dollars in extramural funding. More than eighty percent of this has come from the Army Research Institute. This has covered competitively won contracts to study "Social and Cultural Dynamics of American Military Organization," "Social Structures Affecting Army Performance," and "Social Structure, Social Systems and Social Networks". About fourteen percent has come through competitive grants from the National Science Foundation in support of research on the impact of military downsizing and base closings in Russia on the life course and mental health of Russian Army officers and their wives. About six percent has come from industry, for participation in research on retention and attrition in Navy entry-level training. The remainder has come from private foundations.

Second, I have been asked how research such as ours can help achieve national security goals. Research in the social and behavioral sciences has supported America's armed forces in maximizing soldier and unit performance since World War I, when psychologists developed the first selection and classification tests used to determine who should serve and what jobs they should be assigned. These tests are the progenitors of all of the selection and classification tests used in America today by industry and higher education, as well as by the military. Research utilization continued in World War II, when a generation of America's best sociologists and social psychologists were mobilized to support soldier morale and performance through survey research and training experiments. They contributed to developments in social science research methods and conceptualization, as well as contributing to the management of military

personnel. Social science research was also used extensively in the 1970s to help the services make the transition from a conscription-based force to an all-recruited force.

Today, as the domestic labor force and the international environment change, there are opportunities for the social and behavioral sciences to make continued contributions. Understanding the nature of culture and cultural differences, for example, can help soldiers function in a force that is itself increasingly culturally diverse, reflecting the changing ethnic and racial composition of American society. It will help them participate in coalition operations where they share the battlespace with allies who come from different social backgrounds. And it will help them function is unconventional military operations, where the opponent is not a bureaucratically organized modern army whose soldiers wear uniforms that distinguish them both from friendly forces and from indigenous civilians, but rather irregular forces who blend in with the local population.

Third, I was asked to identify current and emerging areas of research that can contribute to the effectiveness of our national security apparatus. Many of the important areas, such as cohesion and leadership, have long been important, but continued research is necessary as research methods and conceptualization evolve. Others are identified in the 2008 National Research Council report on *Human Behavior in Military Contexts*. This volume focuses on the contributions of psychology, and particularly on cognitive psychology. Other social sciences, such as sociology, anthropology, and economics, as well as other fields of psychology, have contributions to make as well. Secretary of Defense Gates alluded to some of these in his recent discussions of the Minerva Consortia with the presidents of some of our leading research universities. At the individual level, research on the life course decisions of young and older Americans can contribute both to an improved understanding of decisions on the choice of trajectories—military service vs. civilian employment vs. college—as well as how the nation can best serve its veterans who have incurred personal costs through their contributions to our defense. At the institutional level, research on the ways in which organizations and professions are being restructured in America can contribute to our understanding of the contemporary military profession, its organization, and its interface with society. In particular, research on organizations and social networks can contribute to our understanding of non-bureaucratic or irregular forms of military organization and the ways in which they interface with the societies in which they emerge.

Research is also needed on the implications of the recent transformation in the role of the reserve components, from a strategic reserve to an operational reserve. These changes are consequential for our reserve personnel, their families, their civilian employers, and the communities in which they live. In researching the military, new research tools, such as computer and web based survey research may make data collection easier. Qualitative research approaches such as ethnographic and archival research can enrich the statistical picture that surveys help us paint. Application of recent theoretical approaches such as culture theory and social network theory can help us understand the structure of the military, its relationship to society, and the adversaries we are likely to have to face.

In the behavioral and social sciences, the line between basic and applied research is not as clear as it frequently is in the physical sciences and engineering. The findings from basic research are often directly applicable to human resource management practice and policy. Also, research conducted in non-military contexts can frequently have military implications and lessons. For example, psychologist Philip Zimbardo's experiments at Stanford in the early 1970s using students to simulate the behavior of corrections officers eerily anticipated the behavior of military personnel at Abu Ghraib in Iraq a generation later.

Finally, I have been asked to comment on how we communicate our findings to DoD and the military services. Part of this is done through the normal vehicles of science: meetings of professional associations that span the civilian and military boundary, such as the Inter-University Seminar on Armed Forces & Society, and the Society for Military Psychology. It is also done through the peer reviewed journals of these organizations, *Armed Forces & Society*, and *Military Psychology*, which have both uniformed and civilian readers and contributors. There are also important interactions between us and our civilian behavioral science counterparts within the military departments, such as those at the Army Research Institute for the Behavioral and Social Sciences and Navy Personnel Research, Studies and Technology. We also contribute to user-oriented scientific reports published by the armed forces. My colleague, Mady W. Segal, for example, co-authored an important 2007 report on *What We Know About Army Families*, prepared for the U.S. Army Family and Morale, Welfare, and Recreation Command, which is a user-oriented synthesis of the policy-relevant social science research in this area. I authored a 2007 Army Technical Report on *Social Structures Affecting Army Performance*. My colleague, Jeff Lucas, is the senior author of a Navy Technical Report on *The Role of Social Support in First-Term Sailors' Attrition from Recruit Training* that will soon be published.

Perhaps most importantly, we have also found the military to be enthusiastic consumers of our research, and we are frequently asked to serve as consultants to senior military and civilian leaders, and to participate in military conferences and study groups. For example, my colleague Meyer Kestnbaum was the deputy leader of a Secretary of Defense, Office of Net Assessment, Summer Study of "The Military Officer of 2030" at the Naval War College that was briefed to the Secretary of the Air Force, the Director of Net Assessment, and at least twice additionally at the Pentagon. Mady W. Segal has served as a Human Resource Consultant to the Secretary of the Army, as a member of the Board of Visitors of the U.S. Military Academy, as a member of the Congressional Commission on Military Training and Gender-Related issues, and as a Special Assistant to the Chief of Staff of the Army. She just recently made an invited presentation at the U.S. Naval Academy Leadership Conference, on *Leadership Beyond Barriers*. I personally have served as a Special Assistant to the Army Chief of Staff, as a member of the Defense Science Board Task Force on Human Resources Strategy, and as a member of the Board of Visitors of the U.S. Army War College. In recent months I have been invited to participate in an educators' workshop at Marine Base Quantico by the commanding general of the Marine Recruiting Command, to give a keynote address on our research on recruiting and youth attitudes at the Army Recruiting Consortium, and to address the

annual conference of the Court of Appeals for the Armed Forces, attended by hundreds of JAG officers, on changing conceptions of the military profession.

I will be happy to answer any questions you may have on these four issues, or on related topics on which I have expertise.

TESTIMONY

Dr. Mark L. Weiss
Division Director
Division of Behavioral and Cognitive Sciences
Directorate of Social, Behavioral and Economic Sciences
National Science Foundation

Before the

Committee on Armed Services
Subcommittee on Terrorism, Unconventional Threats and Capabilities

and

Committee on Science and Technology
Subcommittee on Research and Science Education

United States House of Representatives

April 24, 2008

Chairman Smith, Chairman Baird, and distinguished members of the Subcommittees, thank you for this opportunity to discuss the social, behavioral and economic (SBE) sciences and the military. I am Mark Weiss, the Division Director for Behavioral and Cognitive Sciences within the Directorate for Social, Behavioral and Economic Sciences at the National Science Foundation (NSF). In this capacity, I oversee programs that fund research in branches of psychology, geography, anthropology and linguistics.

The social, behavioral and economic sciences, or what we also call the human sciences, are concerned with human actions at every level, from an individual's brain, to individual behavior, to the actions of social groups and organizations. Because warfare is a human activity, there are deep and compelling reasons for the military to be cognizant of research in the social and behavioral sciences. From fighting the war on terrorism to understanding and overseeing an immense organization, the SBE sciences can provide military policymakers with knowledge-based solutions to critical challenges.

The federal support of basic research in the social, behavioral and economic sciences is largely funded by NSF through grants to researchers, most of whom are located at academic institutions within the United States. Much of the SBE research carried out by NSF's principal investigators would appear to be either directly or indirectly of interest to the military.

In this testimony, I will first describe the role that NSF plays in advancing basic research in the social, behavioral and economic sciences. Second, I will address the questions received in the invitation from the Subcommittees. It is my hope that my responses to your questions will provide insight into the benefits that the military may realize as a result of NSF's investment in SBE research. I have included examples of opportunities for SBE data, findings and methods that may assist the military in meeting its missions and goals, and means by which collaborations may be nurtured or enhanced.

The Human Sciences

The social, behavioral and economic sciences comprise several different disciplines focused on one common goal: a deeper understanding of human beings at every level. Among the participants are: *anthropologists* studying the workings of cultures and societies; *neuroscientists* and *psychologists* probing the inner workings of the mind and brain; *linguists* seeking the neural basis of language; and *economists*, *political scientists*, *sociologists* and *geographers* mapping the forces at work in today's societies. These researchers study team building, risk management, metrics for assessing U.S. competitiveness, brain function, disaster response, radicalization, the dynamics of conflict, decision making, and much more.

In recent decades, SBE research supported by NSF has resulted in new understandings of human development and social dynamics; of perception, memory, linguistic, and reasoning processes; of how people behave as individuals and collectively; and insight into economic systems. SBE-supported research projects that have resulted in new knowledge, innovations and discoveries that directly benefit the public and inform policy makers. For example, NSF-supported economists provided the Federal Communications Commission with its current "spectrum auction" system for apportioning the airwaves. The auctions have netted over $45 billion in revenue for the federal government since 1994. Other SBE-supported research on decision-making regarding influenza vaccinations has elucidated that persons aged 65 and older were most likely to get influenza vaccinations, while immunization rates for the young were very low. Unfortunately, however, the young, who are choosing not to get vaccinated, are disproportionately responsible for spreading the flu. Thus, community-wide vaccination programs would be more effective in reducing the spread of flu than an approach of targeting specific age groups.

SBE research projects can also directly inform DoD efforts. For example, a study at the University of California at Irvine says stress and fear in the aftermath of the Sept. 11, 2001, terrorist attacks on the World Trade Center and the Pentagon may have prolonged health effects for Americans. For the first time, researchers have evidence that high levels of mental and emotional stress from traumatic events may be linked to an increase in cardiovascular problems among those with no personal, direct exposure to the conditions that caused the stress. Another recent project found that intermediate levels of political freedom and geographic factors

contribute significantly to causes of terrorism, challenging the common view that terrorism is rooted primarily in poverty. A public policy professor at Harvard University's Kennedy School of Government reviewed the World Market Research Centre's Global Terrorism Index and found no clear correlation between terrorism and poverty. Of the research supported within NSF's SBE Directorate, we estimate that approximately 10-15% might be of clear and immediate interest to the military.

It is also important to realize that over recent years, researchers from many domains of science and engineering have developed new tools and approaches that have transformed the SBE sciences. Networked computing, functional MRI brain scanners, geographical information systems, DNA analysis and computer-enhanced surveys all have played roles in transforming the theories and methodologies of the human sciences. Interdisciplinary collaborations are increasingly the norm, with links formed among members of SBE science communities and between SBE scientists and researchers in other fields such as computer science, engineering, mathematics and biology.

The quest for a deeper understanding is also key to managing society's and the military's most critical challenges, which include fighting fanaticism, extremism and terrorism around the world. While it is tempting to pursue purely technological interventions and solutions to these challenges, technology alone cannot provide answers because there is an inescapable human element, which must be appreciated and addressed through the perspectives and approaches of the human sciences.

The Unique Role of the National Science Foundation and the SBE Sciences

NSF is the only federal agency dedicated to supporting fundamental research and education across all fields of science and engineering and at all levels of education. The Foundation's vision, "advancing discovery, innovation and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering," is captured succinctly in the FY 2006-2011 Strategic Plan, *Investing in America's Future.* For more than 50 years, NSF has had an extraordinary impact on the nation's scientific knowledge and capacity.

NSF provides nearly half of the total federal support for non-medical basic research conducted at America's colleges and universities. However, NSF provides a far greater percentage of the support for basic research within many of the human sciences. Approximately 60% of federal support for basic research in anthropology, social psychology and the social sciences at U.S. academic institutions comes from the SBE Directorate at NSF. For some SBE disciplines, NSF supplies more than 90% of the funding for basic research.

NSF invests heavily in competitive merit evaluation based on peer review in order to ensure that the highest quality basic research is funded. As a result of constant deliberation and refinement, NSF's peer-review process is broadly acknowledged to provide the gold standard for merit evaluation. The United Arab Emirates, Saudi Arabia, Turkey, France, and Ireland, among others, are emulating the NSF model.

One indicator of the SBE Directorate's success at identifying and supporting transformative research is that every Nobel laureate in economics since 1998 has been an NSF awardee. Since 1990, 30 of the 35 U.S.-based scholars who have won the Nobel Prize in Economics received funding from NSF.

There is an increasing appreciation of the benefits of interdisciplinary research; a circumstance that precipitates new thinking as scientists approach a common problem with different assumptions, data, methods and perspectives. Indeed at the forefront of the trend towards collaboration across the full range of sciences, the Foundation's priority area in *Human and Social Dynamics* requires interdisciplinary collaborations. Many of the researchers funded through this program are pursuing topics that have clear implications for the military, such as research to understand radicalization, the dynamics of conflict, and disaster response.

A particularly important feature of NSF is its flexibility. NSF's core activity is the support of high quality scientific research. Numerous methods are in place to accomplish this goal, and business processes can be modified to accommodate specific requirements. This makes NSF an ideal partner for establishing new relationships. Innovative solicitations, memoranda of agreement and cooperative funding are routinely implemented.

NSF also has very strong ties to the academic community. Leading experts from academe serve as a central corps for NSF's merit-review system. Scholars provide written reviews, serve on review panels and advisory committees, and participate in workshops. The latter is a particularly productive mechanism for initiating and informing the development of new research themes.

The National Research Council Report and NSF Support of Recommended Research

The U.S. Army Research Institute for the Behavioral and Social Sciences asked the National Research Council "...to provide an agenda for basic behavioral and social research focused on applications in both the near term (5-10 years) and far (more than 10 years) term." The report, "Human Behavior in Military Contexts," details a series of recommendations regarding SBE research that would be applicable to military needs.

Six major research areas with high potential impact were highlighted: (1) Intercultural Competence; (2) Teams in Complex Environments; (3) Technology and Training; (4) Nonverbal Behavior; (5) Emotion; and (6) Behavioral Neurophysiology. Each is relevant to the military in a variety of areas including leadership, training, personnel, social interactions and organizational structures. Interactions between NSF and the military may be one mechanism for achieving the goals described in the report.

NSF supports significant levels of basic research in all of these areas. One can point to specific NSF disciplinary and interdisciplinary programs and provide numerous illustrations. Let me provide several examples of recent NSF/SBE awards that involve each of the research themes highlighted in the NRC report. These examples by no means delineate the boundaries of NSF's support of basic research in these areas; rather, they are specific examples from very large bodies of supported research.

Intercultural competence: Scott Atran and colleagues at the University of Michigan received an award (NSF award #0527396) to study human behavior motivated by ethical or religious beliefs. The hypothesis of this research is that religious or moral values play important roles in creating culturally distinct political and resource-management systems. But current conflict management approaches often assume strictly rational choices among the adversaries, even though cultural choices may frequently be based on ethical or religious beliefs that are not shared or understood by the conflicting cultures. This research has far-reaching implications for military operations in regions where religious beliefs heavily influence local cultural and political systems.

Teams in Complex Environments: The Social Psychology and Decision, Risk and Management Sciences programs jointly fund research (NSF award #0744696) by Susanne Abele (Miami University) to study "Coordination in Small Groups: Matching and Mismatching." This research explores the coordination of behavior of groups during problem-solving. The project places subjects into situations in which they will either match or mismatch their behavior to achieve an outcome. In matching, it is mutually beneficial for actors to choose the same action. In mismatching, it is mutually beneficial for actors to choose different actions (e.g., divisions of labor in teams). Matching and mismatching behaviors are expected to result in different interpersonal impressions and feelings. The planned experiments will examine the conditions under which coordination does and does not foster group cohesion. The results of this type of research are directly applicable to the social dynamics of the types of groups found in the armed services.

Technology and Training: NSF utilizes a number of mechanisms to fund transformative research. One is the establishment of centers which focus knowledge and resources upon a broad challenge facing the nation. The SBE Directorate manages such an effort to create the intellectual, organizational and physical infrastructure needed for the long-term advancement of science-of-learning research. Centers harness and integrate knowledge across multiple disciplines to create a common groundwork of conceptualization, experimentation and explanation that anchor new lines of thinking and inquiry towards a deeper understanding of learning.

There are now six centers, each focused on a different aspect of the science of learning. For instance, the Learning in Informal and Formal Environments (LIFE) Center is an interdisciplinary collaborative effort between scientists at the University of Washington, Stanford University and other institutions (NSF Award #0354453). Its goal, unlocking the powers of human learning in informal and formal settings across the life span, will provide valuable insights to any organization that trains an ethnically diverse population of young adults in complex tasks, such as the U.S. military.

Another example is the Spatial Intelligence and Learning Center, a collaborative effort of scientists at Temple University, Northwestern University, the University of Chicago, University of Pennsylvania and the Chicago Public Schools (NSF Award #0541957). Its overarching goal is to understand spatial learning, and to utilize this knowledge to develop programs and technologies that will transform educational practices. One of their initial tasks is the development of instruments for the assessment of spatial skills.

Emotion: Emotions play a key role in individual perceptions, cognition, motivation and identity formation, while also influencing social interactions and behavior. Recent advances in new technologies such as infrared thermography are being tested as methods for assessing different emotional states by measuring changes in facial temperature. University of Georgia researcher Dawn Robinson explores the connections between different emotional states using facial thermography (NSF award #0729396). Robinson aims to use the technique to discriminate between different emotional states, and to test the sequencing of emotions in social interactions. By measuring relative temperature across different regions of the face, Robinson suggests that the core dimensions of emotion – affect, potency and activity – can be measured. Subsequent experiments will use these new techniques to measure changes in emotional states during on-going interactions; thus, testing theoretical predictions about the sequencing of emotions that individuals experience when moving from one emotional state to another. Ultimately, this work should help advance knowledge about emotions in social interactions.

Nonverbal Communication: NSF supports research through a number of SBE programs, often with co-funding from across the Foundation, which provides insights into the complex individual and group dynamics of human communication and behavior. Humans communicate and share information in a variety of nonverbal ways, picking up on behavioral cues and gestures during face-to-face communication, including the detection of deception, as well as through various types of interactions in computer-mediated environments.

For example, Paul Torrens from Arizona State University (NSF award #0643322) is developing highly sophisticated computer-based models that can provide insights into the ways that individual actions affect behavior on all levels in large group settings. In one set of experiments, Torrens and his students have examined emergency evacuations. They found that subtle stop-and-start movement amid a panicked crowd manifests as ripples in individual behavior. These ripples spawn larger waves, which then wash through the crowd, causing further obstructions and ultimately large-scale congestion. This type of sophisticated agent-based modeling capitalizes on recent advances in computational capabilities and visualization, providing new and innovative tools for research in the SBE sciences.

Behavioral Neurophysiology: The Cognitive Neuroscience Program is one example of an NSF program that supports research on thought, perception, affect and action in the human brain. In one example, John Foxe at CUNY City College is studying the neurophysiology of attentional deployment (NSF award #0642584). He and his team are investigating the ability to selectively attend to "relevant" elements of our environment while ignoring irrelevant or distracting information, a skill that is important in everyday life, but is of supreme importance in a military setting. Two basic neural mechanisms for this selectivity have been proposed. It may be that excitability in those neurons responsible for processing stimuli of interest is selectively enhanced. Alternatively, excitability in neurons receiving inputs irrelevant to the task at hand may be suppressed. Using a novel set of electrophysiological tools, Foxe will begin to determine the relative importance of these two mechanisms.

Additional Near and Far-Term SBE Research with Potential Military Applications and Funding Considerations

One emerging field of science that is of interest to both NSF and the military seeks to optimize human-machine interaction. The technological capabilities of robotic and 'smart' instruments are still far exceeded by those of the human brain. The development of the next generation of intelligent devices will likely benefit greatly from incorporating the human brain's perceptual abilities, high learning rates and ability to generalize. This requires a brain-machine interface that will sample and process neuronal activity in real time. For example, Miguel Nicolelis at Duke University has shown that a monkey can focus its brain activity in order to control a robotic arm and a walking robot.

Exploiting human design in human-machine interactions will require substantial progress on several multidisciplinary fronts. To that end, NSF proposed a $15-million interdisciplinary investment in Adaptive Systems Technology in FY 2009. This new activity will focus on generating creative pathways and natural interfaces between human and physical systems in order to enhance novel adaptive systems. Needed on the technological side is the development of a lightweight, wearable, wireless multi-channel technology for transmitting brain activity to a remote receiver. Pattern-recognition algorithms must be designed and tested for analysis of the complex patterns of brain activity needed for intelligent, interactive control. On the human side, we need to understand the dynamics of brain activity and its individual variation in people.

Many other research areas are imaginable. Ubiquitous computing and related technologies (cell phones, PDAs, email, the Web, etc.) generate immense volumes of interaction records. For example, research published in the 2007 *Proceedings of the National Academy of Sciences of the USA* entitled, "Structure and tie strengths in mobile communication networks," used mobile phone records from a "moderate-sized European nation" to examine the structure of networked interactions and patterns of communication and dissemination. The data set included 7 million phone users and produced 49 trillion dyads for analysis. The data are overwhelming in volume and resolution, and the techniques are novel and dependent on new technologies. With proper attention to confidentiality concerns, research in such areas could be of significant interest to the military.

If DoD wishes to support fundamental research involving the human sciences, the formulation of specific solicitations could also be discussed. For example, SBE was an active partner in a solicitation entitled, "Explosives and Related Threats: Frontiers in Prediction and Detection." This solicitation was coordinated with DoD and leveraged research underway in other areas of the Federal government. Awards that involved SBE scientists included ones that are testing new approaches to the study of threat detection, including the effect of the observer's emotional status on his or her ability to interpret the intentions of another, and improving the effectiveness of explosive-detection dogs through the use of temperament-based selection.

The DoD may also choose to support select NSF-SBE research proposals of interest. For example in FY 2007, the Director of National Intelligence's (DNI) Office of Integrity and Standards transferred $1.3 million to NSF to support 10 research awards aimed at developing new capabilities and techniques to improve the ability of intelligence-community analysts to understand, process and communicate information. Prior to DNI determining which proposals to fund based on their research goals, the proposals were rated and determined meritorious via NSF's peer-review process.

The Current NSF-SBE Directorate and DoD Relationship

Currently, no formal agreements exist between the NSF/SBE Directorate and the DoD. However, a number of informal channels and networks, illustrated via the following list, facilitate communication between the two organizations:

- David Lightfoot, Assistant Director for Social, Behavioral and Economic Sciences is Co-Chair of the National Science and Technology Council's (NSTC) Subcommittee on Social, Behavioral and Economic Sciences. The Department of Defense is represented on the subcommittee.

- The SBE Directorate was integral to the development and conduct of the "Explosives and Related Threats: Frontiers in Prediction and Detection" solicitation. This effort was coordinated with the Department of Defense.

- Several program officers within the directorate have informal connections with colleagues in various units of the Department of Defense.

- NSF is represented on the newly established Subcommittee on Human Factors for Homeland and National Security of the NSTC Committee on Homeland and National Security.

- NSF/SBE and DoD personnel are both participants in informal interagency networks, such as the "Socio-Cultural and Behavioral Science Research Group."

- NSF/SBE program officers have participated in several DoD-sponsored conferences.

- Occasionally NSF/SBE program officers have reviewed research proposals submitted to DoD programs such as "National Security Science and Engineering Faculty Fellowships."

NSF's Activities of Value to DoD & Joint NSF-DoD Research Opportunities

Many DoD personnel may benefit from increased awareness of NSF's programs and research. Increased communication between NSF and DoD may inform a wider audience about the activities of the Foundation that could benefit DoD, and likewise, educate NSF staff on DoD's objectives and research needs. For example, including NSF personnel in select aspects of the DoD Quadrennial Defense Review assessment might provide one venue for educational interchange.

NSF has coordinated with the military in the construction of solicitations, although rarely have these involved SBE. With the increasing appreciation of the benefits that accrue to the military from basic research in the human sciences, such interactions could be expanded. Even in the absence of joint solicitations, NSF can provide expertise in the process of merit-based peer review.

NSF's primary contacts are with academic communities of scholars and researchers. Through these links, the Foundation could help to increase discussion of basic research topics of interest to the military. Models for doing so exist, most notably the support of workshops and symposia.

Most importantly perhaps, NSF could provide the military with a broader perspective on the potentials of SBE research. The results of basic research can be broadly adapted to contexts unrelated to the specific context of the original research. Thus, the findings of basic research conducted in non-military contexts may often be directly transferable to military situations.

As a mission agency, DoD funds investigations that are focused upon national security goals. NSF program officers, on the other hand, see proposals and findings of research on a broader front. This perspective provides a larger picture of activity in human science research, as investigations initiated in one sphere may ultimately lead to research applicable in a military setting.

Conclusion

Mr. Chairmen, I've touched on just a handful of activities and projects found in NSF's diverse and vibrant SBE research portfolio. I hope that I have been able to articulate NSF's unique role in supporting fundamental SBE research and value-added that NSF-supported SBE research may provide to the military community. Thank you for the opportunity to appear before you, and I am happy to answer any questions you may have.

About Dr. Mark L. Weiss

Dr. Mark Weiss is Director of the Behavioral and Cognitive Sciences Division at the National Science Foundation. This division is housed within the Directorate for Social, Behavioral and Economic Sciences. Prior to joining NSF, Dr. Weiss was Professor and Chair of the Department of Anthropology at Wayne State University. Starting in 1990, Dr. Weiss served as Program Director for Physical Anthropology at NSF. He served in this capacity for three rotations during the 1990s until becoming a permanent employee in 2000. In 2005 Dr. Weiss served as Assistant Director for Social, Behavioral and Economic Sciences at the Office of Science and Technology Policy in the Executive Office of the President. Upon returning to NSF, he served as both the Senior Science Advisor in the SBE Directorate and also as Deputy Assistant Director of the Directorate.

Dr. Weiss' research expertise has been in the application of genetic approaches to the study of nonhuman primate evolution and behavior. His most recent publications focused on the evolution of molecules involved in the generation of energy in the human brain.

STATEMENT OF:

COLONEL MARTIN P. SCHWEITZER

COMMANDER, 4 / 82 AIRBORNE BRIGADE COMBAT TEAM

UNITED STATES ARMY

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE, TERRORISM & UNCONVENTIONAL THREATS SUB-COMMITTEE AND THE RESEARCH & EDUCATION SUB-COMMITTEE OF THE SCIENCE & TECHNOLOGY COMMITTEE

UNITED STATES HOUSE OF REPRESENTATIVES

110th CONGRESS, 2nd SESSION

HEARINGS ON

ROLE OF THE SOCIAL AND BEHAVIORAL SCIENCES IN NATIONAL SECURITY

24 April 2008

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ARMED SERVICES COMMITTEE

Introduction

Mr. Chairman and Ranking Members of the House Armed Services Committee and the Science & Technology Committee, thank you for this opportunity to testify how mission-critical Irregular Warfare, non-traditional, and non-kinetic enabling capabilities and technology are achieving desired **effects** in Afghanistan. Having just 10-days ago returned from a 15-month deployment in Afghanistan, let me first thank the Congress and the Nation for your continued support as we persevere against a determined, adaptable enemy. The context for my comments today will be the 4th Brigade Combat Team (BCT), 82d Airborne Division experience in Afghanistan, and specifically the significant non-kinetic effects the pilot Human Terrain System (HTS) program provided to our combat leaders at all levels within the Brigade.

Let me first explain what HTS is. It is a capability to assist Commanders and Soldiers to better understand the "human terrain" they are surrounded by and discern "soft power" means of achieving desired effects. It is built around a 5 to 8 person Human Terrain Team (HTT) at the Brigade Combat Team level comprised of social scientists, anthropological experts, and other trained military personnel. They use a Mapping Human Terrain Tool Kit (MAP HT) to assist with research and analysis and maintaining a human terrain data repository concerning local population social groups, interests, beliefs, motivating factors, leaders, etc. HTTs do not merely serve as embedded cultural advisors for BCT Commanders – but they assist Commanders at every level to maneuver formations within tribal communities in such a manner that reduces the threat to all involved parties. To help with this, there is a Theater-specific,

"Reach-Back Research Center" (RRC) at Fort Leavenworth, Kansas, which provides 24/7 subject matter expert support for deployed teams.

So, what did all this mean for our deployment? It meant -- by better understanding the human terrain, we reduced the number of kinetic operations that otherwise would have occurred. Not only did we reduce the risk to our soldiers, but we reduced the risk significantly to the communities that we operated within. Subsequently, we were able to assist linking the people of Afghanistan to their government at an incredibly accelerated rate. Bottom Line: My Headquarters is uniquely qualified to focus on the enemy as the Center of Gravity. However, today the people are the Center of Gravity – not the enemy; and BCT Headquarters require enablers to optimize their effectiveness. One of these enablers is the HTS capability, which allows the Headquarters to better focus its efforts on the Center of Gravity.

Now, let me tell you what an HTT is not. The Team is not an intelligence-gathering tool which is used to "target" individuals. My Staff is uniquely organized to run the targeting process and link intelligence systems to time sensitive targeting. The HTT, sourced with Anthropologists and Social Scientists, is not qualified or trained to provide targeting support.

Last year, the Army fielded an HTT to my unit as a proof of concept. The HTT was immediately value added and became mission critical. The Team's impacts were exponentially powerful: reduced our kinetic operations, assisted in developing more effective non-kinetic courses of action, improved the unit's overall situational awareness, improved consequence management, increased host nation government

support, improved the Brigade's humanitarian assistance efforts, improved village assessments, improved information operations capabilities, decreased enemy forces attacks, and decreased ordinary crime in our area of operations. Without the HTT filter on courses of action and the alternative maneuver tools they identified to create the exact same effect, we would have lost double the lives. Using HTT capabilities, we reduced kinetic operations by 60-70%.

To illustrate the HTT's effectiveness, I would like to share a few vignettes:

- In the words of one of my company commanders, "Without the HTT, our actions would not have been as precise. If the [Team] weren't there, I would have cordoned off the village, gathered local elders and told them what we were doing, I would have told them to show me their personally-owned weapons, and if they didn't show us their weapons we would [have] taken them. Because of the HTT, I understood my alternatives. If you could have one for every company command, they would be a phenomenal asset."
- According to the Provincial Reconstruction Team (PRT) Commander, "Their [HTT] expertise rapidly identified who to talk to in the village. We were just ricocheting around before they got here, talking to random people. HTT saved me an enormous amount of time – 10-20 hours per village -- in terms of who to talk to. I would take those guys any day of the week."
- The HTT helped the 203rd Afghanistan National Army (ANA) Corps and our Brigade develop non-kinetic courses of action. To provide a specific example: in Ghazni Province, the Taliban had regularly attacked the Government of Afghanistan leaders, Coalition, ANA and Afghanistan National Police for over five years, despite a

very aggressive outreach effort to village elders. The HTT questioned the use of kinetic Courses of Action in the area, observing that the true power brokers in the area were the mullahs, and not the village elders (who were mostly Taliban supporters). After redirecting their outreach effort to the mullahs, the Brigade experienced a rapid and dramatic decrease in Taliban attacks, to the point where this area is currently attack free. Bottom-line: "For five years, we got nothing from the community. After meeting with the mullahs, we had no more bullets for 28 days; captured 80 Afghan-born Taliban ... and 32 Foreign Fighters. As a result of this operation last June, Ghanzi Province no longer harbors the "shadow Taliban government – it no longer exists."

What was the net effect? When we took over in early 2007, only 19 of 86 formal and informal districts supported the government. Today, we assess 72 of those same Districts support their government. I absolutely attribute some of that change to the HTT.

I could elaborate with more metrics and examples of HTT success, but let me conclude. We learned that the population is the key Center of Gravity, the enemy is hiding "among the people," and we must understand the culture to win. However, it is more than just the culture; it is understanding their norms and values from an operational standpoint that creates a bridge between the people and their government, which currently does not exist. The HTT's contribution to Brigades' ability to assess their operating environments, to routinely develop and consider non-lethal input to military planning, and to achieve greater operational success with less kinetic operations is invaluable.

DOCUMENTS SUBMITTED FOR THE RECORD

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Our Intellectual Freedom
John Allen Williams
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Our Intellectual Freedom

John Allen Williams
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Inter-University Seminar on Armed Forces and Society

H. G. Wells once noted that civilization is a race between education and catastrophe. The choice for education should be a simple one. But what is meant by "education"? Its Latin root *e duco*–literally "to lead out"–implies that education brings forth something that is already within the student, much as the song of a nightingale comes forth only when it hears the song of another. Sometimes we sing a long time before we hear a response, and when it comes it is gratifying beyond belief. Most all of us of a certain age have students of whom we are unspeakably proud and who credit us—too much, sometimes—with the success that was always within them. We also hope that our own song is pleasing to those who first sang for us.

Unfortunately, there are at least two ways in which true education is confused with concepts quite different from and even antithetical to it. This may seem an obvious point to those gathered here today, but it is not so obvious to others.

The first confusion is well understood and can be dispensed with quickly: education as training. Those who have suffered through military or corporate "education" programs of brain-deadening detail that did little to broaden the mind understand the difference. Equating education with training is more likely due to misunderstanding than deliberate intent and is found in all professions. It is more annoying than fundamentally dangerous.

The second confusion is more insidious and is often done deliberately by people who know better: education as indoctrination. Some are so certain of their positions on issues of importance to them that opposing views are quite literally unthinkable—even immoral. There are those of all political persuasions who would narrow the range of acceptable thought and think it a moral imperative to stamp out thought crimes by whatever means necessary.

John Stuart Mill reminds us in *On Liberty* that "all silencing of discussion is an assumption of infallibility." As this is impossible, no one has the moral authority to silence others. The wisdom of ideas will be determined in the intellectual marketplace,

Editor's Note: *Armed Forces & Society* is the official journal of the Inter-University Seminar on Armed Forces and Society (IUS). At the October 27, 2007 luncheon of the IUS Biennial International Conference, IUS Chair and President John Allen Williams gave this address in response to certain trends in academia many IUS Fellows find disquieting. Members of the Editorial Board and I believe that this message will also interest the readers of *Armed Forces & Society*.

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in the fresh air of free discussion. Passion is a poor substitute for wisdom, whether in intellectual discourse or public policy. Unfortunately, the most passionate are often the most intolerant, which is destructive of good scholarship and good public policy.

The subjects closest to our intellectual hearts—the military profession and its relationship with a free society—occasion great passion, and appropriately so. They involve issues quite literally of life and death and the survival of the state. These subjects above all must be examined with all of the intellectual rigor we can manage. We will have strong views on these matters. But we will not have the same views, nor should we be required to do so by a new intellectual groupthink that marginalizes certain perspectives or even entire subjects of inquiry. While all of us can think of some opinions so offensive that we would oppose them however we could, we tread a very slippery slope if we try to ban them.

Some of the current respect for the military has rubbed off on those who study it. However, we should be cautioned by Abraham Lincoln, who, when asked to devise a phrase that would always be true, said, "and this, too, shall pass away." We forget too easily that Morris Janowitz himself was subjected for a time to young and not so young thought police opposed to an earlier and even more controversial war who confused his study of the military with a love of war. There was at least one sit-in at his office at the University of Chicago, and he occasionally endured ridicule so vile that I will not repeat it here. We do not assume that physicians love disease, and we should not assume that students of the military or military members themselves love war.

Mark Twain supposedly said that history does not repeat itself, but it does sometimes rhyme. Accordingly, it would be naïve to assume that those days of informal censors cannot return. Not all of the omens are good, as you know if you are following the discussions in *The Chronicle of Higher Education* and elsewhere sparked by those who would prohibit cooperation by academicians in the defense of our countries and perhaps even delegitimize our entire field of inquiry.

How does this relate to us as fellows of this great scholarly society, one based on scholarly excellence and a concern for humane civil–military relations? You will not be surprised to hear that Morris came out ahead in those bad times. But success is more likely if you are an intellectual giant with an international reputation occupying a tenured position in a great university. For those who are not all of those things, affiliation with the IUS, participation in our conferences, and publication in our influential journal *Armed Forces & Society* can be valuable evidence of academic legitimacy in the face of intellectual intolerance. Our well-deserved reputation for upholding the highest intellectual standards and the outstanding scholarship and public outreach efforts of our fellows provide intellectual nurture for all of us and could give shelter to vulnerable junior scholars should academia become more polarized.

The proper use of the military and opinions about this will become more contentious as we move into an era of heightened concern with homeland security. A military operating "over there" will be far more popular than one operating "over here," and the change will challenge traditional notions of proper military roles and

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the military profession. Imagine, for example, the nightmare of a military tasked to enforce the quarantine of a city after a biological attack. We want decisions of this sort made by well-informed and clear-headed leaders with the deepest understanding of the military instrument, not those "full of passionate intensity," in the words of Yeats. That is where we come in—by our scholarship, our teaching, and our participation in the public square.

I hope that my concerns are premature, but military and civilians alike understand that freedom is best defended at the distant ramparts. The canary in our intellectual mine is not dead, but we would do well to monitor its health carefully and resuscitate it when necessary.

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QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD

APRIL 24, 2008

QUESTIONS SUBMITTED BY MR. LIPINSKI

Mr. LIPINSKI. Your university's program in military sociology is the largest of its kind in the country, but you have only four faculty and ten graduate students. Approximately how many other university-based military sociology research programs are there? And which universities conduct most of this research?

Dr. SEGAL. Military sociology is a small specialty within the discipline, and since the 1950s it has been dominated by only one sociology department at any one time: first by the University of Michigan, then by the University of Chicago, then by Northwestern University, and, since the 1980s, by the University of Maryland. These departments have accounted for the greater part of the corpus of research in the field. However, there are military sociologists on the faculties of other universities who conduct research and train graduate students, particularly Texas A&M, the University of Texas at Austin, and Buffalo. And our PhD.s have gone on to other institutions, including Johns Hopkins and Western Illinois University in recent years. In addition, graduate students are doing doctoral work at other universities that involve writing dissertations in military sociology, although their faculty advisors are not military sociologists. They frequently coordinate with Maryland faculty in writing their dissertations, and we have served on dissertation committees at other universities. In addition to the departments named here, research in military sociology is conducted at the U.S. Military Academy, the U.S. Naval Academy, and the U.S. Air Force Academy. Although these institutions do not have graduate students, they have faculty members, both civilian and military, who have Ph.D.s in military sociology, and who have active research programs. These programs are helping to groom the next generation of military officers who will be military sociologists during their academy educations. We coordinate closely with the service academies.

Mr. LIPINSKI. Do you have a sense of the total number of faculty and graduate students working in this area across the country? Is there a critical mass of researchers in the field now? What are the prospects for the future?

Dr. SEGAL. The numbers are hard to estimate. The major professional association of military sociologists—the Inter-University Seminar on Armed Forces & Society (IUS)—has over 600 members, but it is international, interdisciplinary, and the number includes advanced graduate students. On the basis of the number of professional papers given at IUS meetings, meetings of the American Sociological Association, meetings of regional sociological societies, and meetings of interdisciplinary organizations that have heavy sociological participation, I would estimate that there are more than 50 but fewer than 100 sociology Ph.D.s at American universities currently doing research in military sociology. I would also estimate that in addition to students in our program, there are another 10-15 at other Ph.D. granting institutions in the United Stats. In Terms of critical mass, this is enough to sustain the field, but far from enough to meet the research needs of the field. There is much basic research that needs to be done, and we get far more offers to support applied research projects than we have the personnel to address. With regard to the future, the field is growing slowly. Over the last decade, I have seen significantly increased interest among young graduate students in studying the changing military and the changing nature of military conflict. Moreover, the American sociological Association, our major discipline-based professional organization, has been increasingly supportive of sociologists studying the military (unlike professional organizations in anthropology and psychology). However, my generation of military sociologists—primarily people trained at the University of Chicago in the 1960s and early 1970s—is nearing retirement, and while there is a very promising younger generation currently in graduate school or recently finished, the generation in between is generally missing—a casualty, I suspect of academic opposition to the Vietnam War. To create the next generation of leaders in the field of military sociology, we will have to attract to the field with training grants mid-career scholars who bring other human capital to the table, e.g., organizational sociologists and demographers, or accelerate the development of the younger generation through post-doctoral training programs. Increasing the number of Ph.D.s in the field, particularly at institutions that have

already established a record of training military sociologists, will in turn enable us to educate an increased number of new research-oriented Ph.D.s.

Mr. LIPINSKI. Dr. Van Tilborg, does DOD or the individual services that support social and behavioral research have difficulty identifying sufficient numbers of scholars to carry out the needed research? In the wake of Secretary Gates' recent efforts to expand DOD's support for this kind of research, are you aware of any concerns about insufficient numbers of graduate students or researchers?

Dr. VAN TILBORG. At this time, the Department is not aware of a shortage of graduate students or researchers to support social and behavioral research.

Mr. LIPINSKI. Your university's program in military sociology is the largest of its kind in the country, but you have only four faculty and ten graduate students. Approximately how many other university based military sociology research programs are there? And which universities conduct most of this research?

Dr. SEGAL. Military sociology is a small specialty within the discipline, and since the 1950s it has been dominated by only one sociology department at any one time: first by the University of Michigan, then by the University of Chicago, then by Northwestern University, and, since the 1980s, by the University of Maryland. These departments have accounted for the greater part of the corpus of research in the field. However, there are military sociologists on the faculties of other universities who conduct research and train graduate students, particularly Texas A&M, the University of Texas at Austin, and Buffalo. And our Ph.D.s have gone on to other institutions, including Johns Hopkins and Western Illinois University in recent years. In addition, graduate students are doing doctoral work at other universities that involve writing dissertations in military sociology, although their faculty advisors are not military sociologists. They frequently coordinate with Maryland faculty in writing their dissertations, and we have served on dissertation committees at other universities. In addition to the departments named here, research in military sociology is conducted at the U.S. Military Academy, the U.S. Naval Academy, and the U.S. Air Force Academy. Although these institutions do not have graduate students, they have faculty members, both civilian and military, who have Ph.D.s in military sociology, and who have active research programs. These programs are helping to groom the next generation of military officers who will be military sociologists during their academy educations. We coordinate closely with the service academies.

Mr. LIPINSKI. Do you have a sense of the total number of faculty and graduate students working in this area across the country? Is there a critical mass of researchers in the field now? What are the prospects for the future?

Dr. SEGAL. The numbers are hard to estimate. The major professional association of military sociologists—the Inter-University Seminar on Armed Forces & Society (IUS)—has over 600 members, but it is international, interdisciplinary, and the number includes advanced graduate students. On the basis of the number of professional papers given at IUS meetings, meetings of the American Sociological Association, meetings of regional sociological societies, and meetings of interdisciplinary organizations that have heavy sociological participation, I would estimate that there are more than 50 but fewer than 100 sociology Ph.D.s at American universities currently doing research in military sociology. I would also estimate that in addition to students in our program, there are another 10–15 at other Ph.D. granting institutions in the United States. In terms of critical mass, this is enough to sustain the field, but far from enough to meet the research needs of the field. There is much basic research that needs to be done, and we get far more offers to support applied research projects than we have the personnel to address. With regard to the future, the field is growing slowly. Over the last decade, I have seen significantly increased interest among young graduate students in studying the changing military and the changing nature of military conflict. Moreover, the American Sociological Association, our major discipline-based professional organization, has been increasingly supportive of sociologists studying the military (unlike professional organizations in anthropology and psychology). However, my generation of military sociologists-primarily people trained at the University of Chicago in the 1960s and early 1970s—is nearing retirement, and while there is a very promising younger generation currently in graduate school or recently finished, the generation in between is generally missing—a casualty, I suspect of academic opposition to the Vietnam War. To create the next generation of leaders in the field of military sociology, we will have to attract to the field with training grants mid-career scholars who bring other human capital to the table, e.g., organizational sociologists and demographers, or accelerate the development of the younger generation though post-doctoral training programs. Increasing the number of Ph.D.s in the field, particularly at institutions that have already established a record of training military sociologists, will in turn enable us to educate an increased number of new research-oriented Ph.D.s.

Mr. LIPINSKI. You mention in your testimony that of the basic research supported within the Directorate for Social, Behavioral, and Economic Sciences (SBE) at NSF, approximately 10–15% might be of clear and immediate interest to the military. Is that an estimate based on the SBE budget or on the total number of SBE grants? Please provide an estimate of both total funding and number of these grants.

Dr. WEISS. The National Science Foundation (NSF) supports basic research in the social and behavioral, or human, sciences. As such it is often the case that research in what might appear to be one scientific realm informs scientists and policy makers more broadly. For instance, research on teamwork in one setting may be predictive of human interaction in a multitude of circumstances. thus, any attempt to determine which basic research projects might be of interest to the military is indeed an estimate.

Prior to preparing my testimony I informally surveyed relevant program officers as to the percent of awards they felt might be of clear and immediate interest to the military and the 10-15% figure was often mentioned. In making the estimate program officers considered awards that might be relevant to the Department of Defense (DOD) either by virtue of a focus on topics directly related to national security or through a focus on topics that bear on teamwork or the operation of organizations such as DoD.

The two research divisions within the Social, Behavioral and Economic Sciences are the Division of Behavioral and Cognitive Sciences (BCS) and the Division of Social and Economic Sciences (SES). In 2007, the two divisions combined to process approximately 1,000 award actions. This figure includes new awards as well as increments granted to awards made in prior years. Thus we estimate that approximately 100-150 award actions involved proposals that we believe the military would find to be of value.

Please note that these awards run the gamut from support of doctoral dissertation research to large, multi-institutional and interdisciplinary team projects. A reasonable estimate of total investment in awards related to either national security or the operation of teams or organizations is approximately $10-20M per year.

A few examples of projects that we view as pertinent include:

I. Social & Behavioral Science Research Relevant to National Security

Title: Collaborative Research: Mitigating Disaster and Terrorism Impacts to Critical Infrastructure

PI(s): Timothy Matisziw (Ohio State University), Tony Grubesic (Indiana University)

Program: Geography and Regional Sciences

Award ID: 0720989, 0718091

Award $: $234,197

Summary: This collaborative research project will develop several new approaches for examining critical network infrastructures such as transportation, communication, and utility systems, and assessing their vulnerability to debilitation caused by disaster, accident, or intentional harm.

Title: Collaborative Research: Interactive Deception and its Detection through Multimodal Analysis of Interviewer-Interviewee Dynamics

PI(s): David McNeill (University of Chicago): Judee Burgoon (Univerity of Arizona); Dimitris N Metaxas (Rutgers University New Brunswick); Timothy R. Levine (Michigan State University)

Program: Human and Social Dynamics

Award ID: 0725607, 0725685, 0725762, 0725895

Award $: $1,253,851

Summary: This collaborative multi-disciplinary research seeks to uncover the complexities and dynamics of the communication processes that make deception possible, as deception is a pervasive feature of social life that is often undetected because deceivers capitalize on features of the interpersonal communication process The highly multi-disciplinary team includes researchers in communication, linguistics, psychology computer science and management information systems.

Title: Doctoral Dissertation Research in Political Science: The Treatment of Ethnic-Others During Violent Conflicts

PI(s): Lisa Wedeen (University of Chicago)

Program: Political Science

Award ID: 0418474

Award $: $12,000

Summary: The proposed project will advance knowledge about the role of ethnicity in violent contexts by both testing it against alternative explanations such as military strategy, and by exploring whether and why the importance of ethnicity varies among different communities

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Title: Risk-based Methodological Framework for Scenario Tracking and Intelligence Collection and Analysis for Terrorism

PI(s): Yacov Haimes University of Virginia

Program: DRMS (also MMS, Disaster Response Teams, and Infrastructure Systems Management and Hazard Responses

Award ID: 0322146

Award $: $473,399

Summary: This project seeks out useful insights about how to anticipate and more readily discover terrorist attacks in the planning phase, based on the major premise that in planning, supporting, and carrying out a terrorist plot, those involved will conduct a series of related activities constituting a threat scenario, which can be systematically observed and analyzed with the right intelligence and acquirable evidence.

Title: Perceptions of the Past, Present, and the Future: A Survey of the Iraqi Public

PI(s): Mansoor Moaddel (Eastern Michigan University)

Program: Human and Social Dynamics

Award ID: 0433773

Award $: $120,438

Summary: This project examines worldviews of the Iraqi public and the social effects of the Iraqi State's swift breakdown, and the resulting new social conditions. In addition to broad social science implications on cultural transformation, state formation, foreign occupation, and national identity, this research will make important contributions specific to the political situation in Iraq, enhancing understanding between the American and Iraqi publics, and providing insights into Iraqi society necessary for building a post-Saddam democratic polity.

Title: The Impact of Terrorism on Perceptions of Justice and Decision-Making

PI(s): Angela Cole (Howard University)

Program: Social Psychology, Decision Risk & Management Sciences

Award ID: 0422544

Award $: $125,376

Summary: This research project will investigate the effects of security threats and death-related thoughts on people's decision-making processes, which is a particularly relevant research question in light of the events of September 11, 2001, during and after which Americans appear more willing to defer without reservation to authorities' imposition of severe restrictions on civil liberties, with very little opportunity for public comment and discussion.

II. Social & Behavioral Science Research Relevant to Teamwork & Cooperation

Title: Doctoral Dissertation Research: Group Allegiance and State Institutions in Kyrgyz Identity

PI(s): Roy G. D'Andrade, with graduate student Schuan G. Wheeler (University of Connecticut)

Program: Cultural Anthropology

Award ID: 0717091

Award $: $14,530

Summary: This research will build a general model of how individuals navigate group allegiances in ways that motivate them to participate in large scale social action, and will yield a useful modeling tool for the development of successful policies, development programs, and social interventions for an array of geopolitical contexts.

Title: A Field Experiment Incentivizing Exercise Among Workers

PI(s): Heather Royer (Case Western University)

Program: Decision & Risk Management Sciences, Economics

Award ID: 0819804

Award $: $264,288

Summary: This research explores theories of economic incentive as motivational factors in the exercise habits of American adults, and the duration of an intervention's effect on participants' long-term behavior. The results will help improve the design of wellness plans and healthcare policies will contribute significantly to the understanding of self-control, psychological barriers, and motivation in diverse domains beyond that of exercise and will have important implications for promoting successful motivation practices among workers, teams and other groups.

Title: Reciprocal Learning in Problem-Solving Teams: A Multi-method Investigation of Knowledge Bridging in Emergent Groups

PI(s): Philip Birnbaum-More (University of Southern California)

Program: Innovation and Organizational Sciences

Award ID: 0725088

Award $: $449,188

Summary: This study will examine key mechanisms in the functioning of innovative emergent groups, or teams of relative strangers who cross disciplines, functions, and organizations, to rapidly come together and leverage diverse knowledge to solve problems, focusing specifically on how such a team decides who has relevant knowledge and capabilities, and who can be trusted as problems and their solutions evolve and change. The study will yield practical, empirically validated job aids to facilitate rapid group problem-solving, which will be relevant to any organization or teamwork scenario, including those within the structure and mission of DoD.

Title: Accuracy in the cross-cultural understanding of others' emotions

PI(s): Hillary Anger Elfenbein (UC Berkeley)

Program: Social Psychology

Award ID: 0617634

Award $: $205,517

Summary: This proposal seeks to better understand how humans recognize the emotional states of other people which is important for gauging reactions, attitudes, intentions, and likely future behaviors, with the research focusing how and why the accuracy of such perceptions is demonstrably lower when reading emotional expressions of individuals from foreign cultural groups. The project will also provide guidance to overcome this cross-cultural challenge.

III. Education & Training for Social & Behavioral Science Research Relevant to National Security

Title: REU Site: Hazards, Disasters, and Society: Training the Future Generations of Social Science Researchers

PI(s): Havidan Rodriguez (University of Delaware)

Program: Researh Experiences for Undergraduates, Co-funded by DOD (ASSURE program)

Award ID: 0451219

Award $: $217,330

Summary: This research site involves undergraduates in social science research projects related to disaster mitigation, preparedness, response and recovery, warnings and technology, and disaster vulnerability and resilience, and also provides professional development workshops to prepare students for research careers.

Title: Research, Experience for Undergraduates in Fatigue Effects on Performance in Military, Medical, and Law Enforcement Personnel

PI(s): Lauren Fowler (Weber State University)

Program: Researh Experiences for Undergraduates, Co-funded by DOD (ASSURE program)

Award ID: 0648735

Award $: $106,880

Summary: This program will provide support for undergraduate students to design and conduct independent research in collaboration with researchers from Weber State University and the Air Force Warfighter Fatigue Countermeasures Branch, examining the effects of fatigue on physiological, psychological, cognitive, behavioral, health, and social performance in military, medical, and law enforcement personnel.

QUESTIONS SUBMITTED BY MR. SMITH

Mr. SMITH. There are some inside and outside of the anthropological community who are resisting the participation of academic community or anthropologists to support HTT efforts. How have you handled this resistance?

Colonel SCHWEITER. From the unit perspective there is no impact. The Program Manager (PM) Human Terrain System (HTS) has engaged the anthropological community in an open manner. PH HTS has been a member of the American Anthropological Association (AAA) and Society for Applied anthropology for over a year. PM HTS personnel attended the last AAA convention as well as numerous AAA and other anthropological associations' conferences. Many of the HTS program's Social Scientists are long-standing members of the AAA and other anthropological associations. As such HTS personnel are continually engaged in the discussion within their professional community. It should be noted that many within the anthropological community support and participate in the HTS program. This is substantiated by the professionals that supported my unit, and the ever-growing number of social scientists that participate in the HTS program as it provides support to more units in OIF and OEF.

Mr. SMITH. There are some inside and outside of the anthropological community who are resisting the participation of academic community or anthropologists to support HTT efforts. Has the resistance affected your ability to work with the HTTs to accomplish your mission?

Colonel SCHWEITER. Not at all. The experts on the HTTs have been and will continue to be value added in every regard of dealing with the complex operations in Afghanistan. Their contributions have been invaluable.

Mr. SMITH. There are some inside and outside of the anthropological community who are resisting the participation of academic community or anthropologists to support Human Terrain Team (HTT) efforts. What would you say to mollify their concerns?

Dr. VAN TILBORG. I understand their criticisms and concerns. The strongest argument in favor of HTTs that comprise academics is that they seem to work. The evidence seems to indicate that HTTs reduce the intensity and scale of combat oper-

ations considerably, resulting in significantly reduce the intensity and scale of combat operations considerably, resulting in significantly reduced casualties for both Coalition Forces and the local population.

Mr. SMITH. What legal or regulatory structures are in place to guide this type of research (for example, privacy protection regulations or policies related to human or animal testing)? Are there structural prohibitions that prevent the effective development or use of socio-culture tools, anthropologists, etc. . .?

Colonel SCHWEITER. Research involving human rights is covered by 32 Code of Federal Regulations 219 "Protection of Human Subjects" and DoDD 3216.02 "Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research," among others.

Mr. SMITH. The Defense FY09 request included a significant increase in the overarching basic research budget (about $270 million). How much is the Department currently spending on behavioral and social science basic research?

Dr. VAN TILBORG. The basic research program is executed primarily through the Military Departments research offices. Currently, there are three Multidisciplinary University Research Initiative (MURI) topics, one per Military Department, focused specifically on socio-cultural understanding. This is equivalent to a $3M/year investment. In Fiscal Year 2008, the other investments of basic research funds (Budget Activity 1) for social science research are $6.2M for the Navy, $9.7M for the Army, and $3.5M for the Air Force.

Mr. SMITH. The Defense FY09 request included a significant increase in the overarching basic research budget (about $270 million). And how much of the increased funding is planned for this area across the Defense future budget?

Dr. VAN TILBORG. For Fiscal Year 2009, the increased basic research amount will fund two separate Department-wide Broad Agency Announcements (BAA), one each in Defense Research Sciences and University Research Initiatives (URI).

Increased funding will be applied to specific areas from a set of eleven Grand Capability Challenges. One of those areas is Human Sciences (cultural, cognitive, behavioral, neural). Contingent on the quality and relevance of responses received for this area, up to $25 million annually could be awarded for this research over the Future Years Defense Plan (FYDP).

DoD issued a separate BAA found at http://www.arl.army.mil/www/default.cfm?Action=6&Page=8 for the MINERVA social science initiative which will be funded in Fiscal Year 2009 by each Service at around $3 million from the URI portion of those funds. The anticipated duration of each project is one five year term with the possibility of one renewal. The Department projects that the URI component of the MINERVA initiative will cost about $10 million each year over the FYDP, depending on the number, quality, and scope of the proposals that are received, evaluated, and selected.

Mr. SMITH. The Defense FY09 request included a significant increase in the overarching basic research budget (about $270 million). Does any of this funding support the generation of a new workforce that the Department may call on to support its socio-culture needs?

Dr. VAN TILBORG. Yes, DOD basic research in the social sciences will support undergraduate and graduate students who the Department may be able to call on.

Mr. SMITH. Are we putting the same rigor in behavioral and social science research, as we put in other areas of research—especially in terms of understanding the risk and the need for robust metrics?

Dr. VAN TILBORG. Yes the intention is to put the same rigor into social science research as we find in the more traditional 'hard' sciences. It is a misperception to think that the so-called 'soft' sciences do not follow rigorous experimentation and inferential statistical methodologies. Work in the area of Human Social, Culture and Behavior (HSCB) Modeling will be challenging. To understand and forecast human and social behaviors is very complex. Part of this program's efforts is focused on developing quantitative metrics and validation methodologies and processes for modeling in this area.

Mr. SMITH. As you know, when new concepts or novel technological capabilities emerge we often see a growth of activities, often duplicative efforts across the Department. Do you see an expansion happening in this area?

Dr. VAN TILBORG. Yes, we are deliberately attempting to expand research in this area because of its potential for application in various military missions. The expansion is being done in a collaborative and joint fashion that will assure duplicative efforts are avoided. The research community within DOD that is beginning to take on this work is relatively small. Coordination within DOD is being managed via existing processes for oversight within the Human Sciences area.

Mr. SMITH. As you know, when new concepts or novel technological capabilities emerge we often see a growth of activities, often duplicative efforts across the De-

partment. What is the Department doing to assure that taxpayers' dollars are effectively spent on healthy competition of ideas and not wasting their dollars on duplicative programs?

Dr. VAN TILBORG. The Human Social, Culture and Behavior (HSCB) Modeling program is advertised via the issuance of Broad Agency Announcements (BAA), with full and open competition for all three budget activities (Budget Activity 2, 3, and 4). In Budget Activity 1, Multidisciplinary University Research Initiatives (MURI) are also executed via a BAA and with open competition. BAAs typically attract a large number of competitors throughout industry and academia who propose many research and demonstration ideas. These proposals are down-selected by subject matter experts to ensure that only the most innovative and meritorious proposals are funded, and that duplication is avoided.

Mr. SMITH. Along this same line, I understand that the Programs, Analysis and Evaluation (PA&E) office within the Department recently issued a Request for Information (RFI) regarding an Agent-Based Modeling of Irregular Warfare (ABMIW), which is a computer model that will forecast the consequence of specific actions. Are you aware of this effort? If so, how are you coordinating with PA&E?

Dr. VAN TILBORG. We are fully aware of the RFI from PA&E on ABMIW. ABMIW did not go beyond the RFI phase. Instead, a decision was made by PA&E and the Joint Staff to do an assessment of the Defense Advanced Research Projects Agency (DARPA) Conflict Modeling, Planning, and Outcome Experimentation (COMPOEX) program and COMPOEX tools as part of a wargaming effort. The Office of the Deputy Under Secretary of Defense (Science and Technology) is actively involved with this assessment and in discussions with the COMPOEX program managers on the possible transition (pending the assessment) of this work into operational use. We are also aware of the other modeling efforts, their evaluations of research products in this topic area and other interests within PA&E. Staff within PA&E participated in the Fiscal Year 2008 Human Social, Culture and Behavior (HSCB) proposal solicitation and review process.

Mr. SMITH. Along this same line, I understand that the Programs, Analysis and Evaluation (PA&E) office within the Department recently issued a Request for Information (RFI) regarding an Agent-Based Modeling of Irregular Warfare (ABMIW), which is a computer model that will forecast the consequence of specific actions. What mechanisms are in place to promote coordination of behavioral and social science research efforts across the Services and Agencies? Is there a formal or process-driven mechanism?

Dr. VAN TILBORG. The Department's Science and Technology investments are coordinated through a formal process called Reliance 21. All of the Services and Science and Technology (S&T) agencies participate in Reliance 21, led by the Director, Defense Research and Engineering (DDR&E). Coordination of behavioral and social science research efforts falls under the Human Systems Defense Technology Area, which is overseen by the Director for Biosystems in the DDR&E office. The Human Social, Culture and Behavior (HSCB) program and the other related S&T work in the DOD Components are coordinated within their purview.

Mr. SMITH. The DOD S&T community has been primarily managed by scientists and engineers with hard science backgrounds. How are you reaching out to recruit social scientist to manage human, social, and cultural behavior-type efforts?

Dr. VAN TILBORG. I believe that the DOD has a sufficient number of social scientists, both military and civilian, who have experience in program management, modeling and simulation, training, and decision aid development to manage the Human Social, Culture and Behavior (HSCB) program. To supplement that staff, the Department is drawing on expertise from social scientist in academia, Federally Funded Research & Development Centers (FFRDCs), DOD educational institutions, and other agencies of the Federal Government, such as the National Science Foundation, to assist with tasks such as Broad Agency Announcement (BAA) preparation and proposal review.

Mr. SMITH. The DOD S&T community has been primarily managed by scientists and engineers with hard science backgrounds. I would imagine that there are others in the world, perhaps better qualified to support socio-cultural activities, is there a process for getting them into the human terrain system?

Dr. VAN TILBORG. As noted in the answer to a previous question, staff with relevant expertise is being drawn from a variety of sources outside of the Department's scientists and engineers with hard science backgrounds to assist with the Human Social, Culture and Behavior (HSCB) program.

Mr. SMITH. The DOD S&T community has been primarily managed by scientists and engineers with hard science backgrounds. Are we sacrificing the recruiting of physical or biological scientists and engineers in an attempt to recruit more social scientists?

Dr. VAN TILBORG. No, I have not seen any evidence of such a trend to date.

Mr. SMITH. How are the Department's behavioral and social science research efforts linked with emerging policy and joint concepts (such as the new Counterinsurgency Field Manual; the Army's new Field Manual on operations; DOD Directive on Stability and Reconstruction Operations)? How do you link what is being learned in this research to operational users (and vice versa)?

Dr. VAN TILBORG. The social science research efforts are linked with these concepts via a number of coordination groups that were created out of the Office of the Secretary of Defenses Irregular Warfare Working Group. The Human Social, Culture and Behavior (HSCB) program, in particular, is establishing a program oversight group that includes both science and technology experts, as well as the operational users for HSCB and social science products. The users include the operations planning community, the training communities, military civil affairs, and field commanders. This oversight group is meant to help elucidate HSCB requirements and to ensure the acceptance of technology products in the field.

Mr. SMITH. The current vision for the Department's program called Human, Social, and Cultural Behavior (HSCB) Modeling is the low-hanging fruit that will have near-term impact for the warfighter. What takes the place of this effort when it is completed and transitions to the operational user community?

Dr. VAN TILBORG. The HSCB program was born out of the recognition that many of the 'products' being developed and rapidly fielded to support efforts in Iraq were not being developed to be sustainable, generalizable to other uses or regions, and not being properly configured to be lifecycle managed. The HSCB program is using Budget Activity 4 funds in Fiscal Year 2008 and Fiscal Year 2009 to move some initial capabilities to the field. The HSCB program is targeting efforts that will 'have a home' within existing command, control, and planning tools that are part of formal Programs of Record (POR). These PORs will manage the HSCB products life-cycle. Regarding Science and Technology efforts that may eventually follow HSCB, it is pre-mature to determine whether such efforts would be prudent investments until HSCB results can be evaluated.

Mr. SMITH. The current vision for the Department's program called Human, Social, and Cultural Behavior (HSCB) Modeling is the low-hanging fruit that will have near-term impact for the warfighter. Are there foundational efforts that need longer-term research that we should also be focused on?

Dr. VAN TILBORG. Yes. The HSCB program conducts a limited amount of foundational work in Budget Activity 2. Also, related efforts under the Multidisciplinary University Research Initiative in Budget Activity 1 develop the foundational science base of socio-cultural modeling within a military context.

Mr. SMITH. Col Schweitzer mentioned at least one tool, MAP-HT, as being deployed last year to support the Human Terrain Team efforts. Are there other tools that are ready for transition?

Dr. VAN TILBORG. Yes. There are other tools and products that are mature enough for transition funding. However, they go beyond just support of Human Terrain Teams. The Human Social, Culture and Behavioral (HSCB) Modeling program is funding the transition of operational planning tools for Special Operations Forces that include socio-cultural considerations. There are also training and experimentation content and tools that could be transitioned in the near-term.

Mr. SMITH. Col Schweitzer mentioned at least one tool, MAP-HT, as being deployed last year to support the Human Terrain Team efforts. Is there adequate funding in place to transition the most promising near-term technology?

Dr. VAN TILBORG. Funds from Human Social, Culture and Behavior (HSCB) Budget Activity (BA) 4 provide a mechanism for transitioning products to the warfighter. In Fiscal Year 2008, additional transitions may have been possible if BA 4 funds had been greater. The Fiscal Year 2009 President's Budget for HSCB requests funds that would enable an increase in the number of products that transition to the warfighter.

Mr. SMITH. Can you please explain how you are balancing your investments across the spectrum of science and technology (basic research, applied research and advanced technology development) in the area of behavioral and social science?

Dr. VAN TILBORG. Investments in the Human Social, Culture and Behavior (HSCB) Modeling program are distributed across Budget Activities 2, 3, and 4 in a manner that facilitates maturation of technical concepts into tools that are ready for experimentation and demonstration in the relatively near term. The balance of resources in HSCB is heavily weighted to develop, demonstrate, and validate applied science and general-use capabilities and software tools to support HSCB applications in intelligence analysis, planning and education, training and experimentation.

Mr. SMITH. How are you balancing research to understand ourselves, and how to understand the cultural process of foreign societies?

Dr. VAN TILBORG. The Human Social, Culture and Behavior (HSCB) Modeling program's Broad Agency Announcement is not restricted to understanding non-Western societies and 'red' forces. It was intentionally left open to allow for the study of our own forces, our own forces' ability to work within coalition forces, as well as in non-coalition environments.

Mr. SMITH. How are you balancing investigator-driven (grants) versus governmental problem driven (contractors) research?

Dr. VAN TILBORG. The HSCB Fiscal Year 2008 Broad Agency Announcement (BAA) was used as the solicitation for both the commercial/industry offerors as well as the basis for government laboratory white paper submissions. The proposals were all evaluated by the same group of government experts and awards were made based upon merit. The basic research money that funds primarily academic institutions was run through the respective Service BAA processes.

Mr. SMITH. Is there a feedback mechanism for evaluating outcomes and introducing those lessons learned back into existing and proposed new research?

Dr. VAN TILBORG. The Human Social, Culture and Behavior (HSCB) Modeling program is establishing a program oversight group that includes both science and technology experts, as well as the operational users for HSCB and social science products. The users include the operational planning community, the training communities, military civil affairs, and field commanders. This oversight group is meant to help elucidate HSCB requirements and to ensure the acceptance of technology products in the field. In addition, the HSCB program coordinates with other ongoing efforts in the Department in the social science area. This includes connections to the Human Terrain Initiative, the Measuring Progress in Conflict Environments (MPICE) project, and others that are attempting to capture real-world use scenarios for social science products/concepts.

Mr. SMITH. How do we leverage the foreign expatriate communities within the U.S. to support behavioral and social research in a military context?

Dr. VAN TILBORG. Several of the proposed projects under the Human Social, Culture and Behavior (HSCB) Modeling program Broad Agency Announcement and the recent U.S. Army Multidisciplinary University Research Initiative Project in this area included using these populations as a data resource on non-Western cultures and beliefs. Other offerors suggested collaborations in other countries to collect such information/knowledge.

Mr. SMITH. How do we leverage our key partners and allies in these efforts?

Dr. VAN TILBORG. Staff members responsible for Human Social, Culture and Behavior (HSCB) Modeling program oversight also participate in the North Atlantic Treaty Organization's Human Factors and Medicine and The Technical Cooperation Program Human Resources and Performance Group efforts where ongoing panels are coordinating work across the represented nations in the area of socio-cultural understanding.

Mr. SMITH. What legal or regulatory structures are in place to guide this type of research (for example, privacy protection regulations or policies related to human or animal testing)? Are there structural prohibitions that prevent the effective development or use of socio-culture tools, anthropologists, etc. . .?

Dr. VAN TILBORG. Research involving human subjects is covered by 32 Code of Federal Regulations 219 "Protection of Human Subjects" and Department of Defense Directive 3216.02 "Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research," among others.

Mr. SMITH. There are some inside and outside of the anthropological community who are resisting the participation of academic community or anthropologists to support HTT efforts. How have you handled this resistance?

Dr. SEGAL. Since I am a sociologist, not an anthropologist, I have been watching this resistance primarily as an outsider. I should note, however, that it is not confined to anthropology, although that is where the strongest opposition has occurred, and it is nothing new. The academic social science community turned against the military during the Vietnam War, when it failed to differentiate between the war and the people the nation sent to fight it. It was manifested in anthropology through opposition to Project Camelot. One of the victims was David Marlowe, a social anthropologist who was the long-time head of the Department of Military Psychiatry at the Walter Reed Army Institute of Research. He is a Harvard Ph.D. who was basically drummed out of the American Anthropological Association during the war, and never welcomed back.

In sociology, the major military sociologists were all subjected to local attacks and harassment. Morns Janowitz was hanged in effigy at the University of Chicago, radicals tried to occupy Charles Moskos's office at Northwestern, and there was a

sit-in outside my office at the University of Michigan. When I agreed to direct the sociological research program at the Army Research Institute during the early years of the volunteer army, a number of my colleagues questioned why I would do such a thing, but there was no disciplinary opposition as was manifested in anthropology. Sociology has since matured, to the point where the president of the American Sociological Association invited me to organize and preside over a panel at our annual meeting on sociological research and military policy, and the ASA selected me to receive an award for contributing to public understanding of sociology, for my analyses of war and the military. Anthropology has not moved far in this direction of legitimizing study in this area.

The resistance in anthropology has largely been handled by working within professional organizations. What is now a sizable community of anthropologists who study the military has been acting as a caucus within the American Anthropological Association? In addition, John Allen Williams, who the president of the Inter-University Seminar on Armed Forces & Society, which is the major international and interdisciplinary professional organization of social scientists who study the military, made the issue of intrusion on academic freedom the theme of his presidential address last fall. He did this in support of the anthropologists. His presidential address was recently published in Armed Forces & Society, the major professional journal in the field.

Mr. SMITH. Has the resistance affected your ability to work with the HTTs to accomplish your mission?

Dr. SEGAL. I haven't worked directly with HTTs. I have worked with civilian social scientists and with military officers who have worked with HTTs. I have had no problems with my colleagues, my university, or my discipline in this regard.

Mr. SMITH. What would you say to mollify their concerns?

Dr. SEGAL. I have not been placed in this position. Were it to happen, I would argue for the HTT process both on the basis of it enabling military forces to accomplish their missions through the substitution of cultural understanding for firepower, thus reducing casualties and fatalities on both sides, and on the basis of academic freedom. I think the former argument is the more important and more persuasive.

Mr. SMITH. What legal or regulatory structures are in place to guide this type of research (for example, privacy protection regulations or policies related to human or animal testing)? Are there structural prohibitions that prevent the effective development or use of socio-cultural tools, anthropologists, etc . . .?

Dr. SEGAL. All federally funded research on human subjects, whether it is conducted in the United States or abroad, is subject to federal regulations, designed to guarantee privacy, confidentiality, and minimization of risk to research subjects. Researchers are also bound by discipline-based codes of professional ethics, although these do not have the force of law. Most major American research universities have extended the human subject protections to all such research, regardless of whether it is federally funded. Thus a social scientist working for a university or for a federal agency is generally required to have a research protocol approved by an Institutional Review Board, to assure that human subject protections are in place. Universities and other research entities, in turn, are increasingly having their protection programs reviewed and accredited by the Association for Accreditation of Human Research Protection Programs, and organization sponsored by a consortium of medical and social science professional associations to assure the quality of such programs. I have served on the site visit teams for a number of such reviews, and can vouch for their quality.

Mr. SMITH. There are some inside and outside of the anthropological community who are resisting the participation of academic community or anthropologists to support HTT efforts.

- How have you handled this resistace?
- Has the resistance affected your ability to work with the HTTs to accomplish your mission?
- What would you say to mollify their concerns?

Dr. WEISS. The National Science Foundation (NSF) has a statutory mission "to promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense . . ." To meet this aim, the NSF invests in basic research that enables the Nation's future through discovery, learning and innovation.

Human Terrain Teams (HTTs) are a program of the Department of Defense. As we understand these teams, they draw on the knowledge base of the social and behavioral sciences in order to provide the military with insights about social and cul-

tural phenomena in Iraq and Afghanistan. Recognizing that the results of NSF-supported research are often published and shared across scientific research communities, it is to be expected that these results help to improve fundamental knowledge within the human sciences. There are multiple NSF programs that fund basic research in the human sciences. Thus, NSF-supported research certainly informs the HTTs, but NSF's programs do not directly or indirectly fund HTT activities.

The deliberations that have taken place in the disciplinary communities about anthropologists supporting HTT efforts have been a matter of discussion within NSF, most recently at the Directorate for Social, Behavioral and Economic Sciences Advisory Committee meeting. Through such discussion we have heard both concerns about, and support for, HTTs. These discussions have also served as a forum for highlighting the fact that NSF is not involved in the HTT activities. However, there was a general feeling within the research communities that the greater the input by the human sciences into the DoD's deliberations, the more positive the outcome would be for the DoD, the HTTs, and the people of the local communities involved.

Mr. SMITH. What legal or regulatory structures are in place to guide this type of research (for example, privacy protection regulations or policies related to human or animal testing)?

- Are there structural prohibitions that prevent the effective development of use of socio-culture tools, anthropologists, etc . . .

Dr. WEISS. The NSF takes seriously privacy protection, confidentiality, and safety. Any basic research project funded through the NSF requires conformance with the Common Rule (45 CFR 46) for the Protection off Human Research Subjects. Universities and other institutions must approve through their Institutional Review Boards (IRBs) research involving human research subjects. The NSF does not fund any research project involving human subjects that has not received IRB approval. Similarly, if research involves the use of vertebrate animals, an Institutional Animal Care and Use Committee (IACUC), must review and certify that the research provides sufficient protection for the care and use of laboratory and other animals. In both cases, the responsibility for review is placed on the institutions, and NSF will not expend funds for a research project in the absence of appropriate IRB and or IACUC approvals.

The HTTs are supported by DoD; they are not funded by NSF. Thus, NSF is not involved in the regulation of HTT efforts nor does the agency play any role in decisions related to HTT activities.

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