Written Testimony of Jennifer Vendemia, Ph.D.
on behalf of the
American Psychological Association

Submitted to the
United States Senate
Committee on Appropriations
Subcommittee on Defense
The Honorable Ted Stevens, Chairman

Fiscal Year 2006 Appropriations for the Department of Defense

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Conflict is, and will remain, essentially a human activity in which man's virtues of judgment, discipline and courage – the moral component of fighting power – will endure…It is difficult to imagine military operations that will not ultimately be determined through physical control of people, resources and terrain – by people…Implicit, is the enduring need for well-trained, well-equipped and adequately rewarded soldiers. New technologies will, however, pose significant challenges to the art of soldiering: they will increase the soldier's influence in the battlespace over far greater ranges, and herald radical changes in the conduct, structures, capability and ways of command. Information and communication technologies will increase his tempo and velocity of operation by enhancing support to his decision-making cycle. Systems should be designed to enable the soldier to cope with the considerable stress of continuous, 24-hour, high-tempo operations, facilitated by multi-spectral, all-weather sensors. However, technology will not substitute human intent or the decision of the commander. There will be a need to harness information-age technologies, such that data does not overcome wisdom in the battlespace, and that real leadership – that which makes men fight – will be amplified by new technology. Essential will be the need to adapt the selection, development and training of leaders and soldiers to ensure that they possess new skills and aptitudes to face these challenges.

NATO RTO-TR-8, Land Operations in the Year 2020

Mr. Chairman and Members of the Subcommittee, I'm Dr. Jennifer Vendemia from the University of South Carolina Psychology Department. I am submitting testimony on behalf of the American Psychological Association (APA), a scientific and professional organization of more than 150,000 psychologists and affiliates.

Although I am sure you are aware of the large number of psychologists providing *clinical services* to our military members here and abroad, you may be less familiar with the extraordinary range of *research* conducted by psychological scientists within the Department of Defense (DoD). Our behavioral researchers work on issues critical to national defense, with support from the Army Research Institute (ARI) and Army Research Laboratory (ARL); the Office of Naval Research (ONR); the Air Force Research Laboratory (AFRL), and additional, smaller human systems research programs in the Office of the Secretary of Defense, the Defense Advanced Research Projects Agency (DARPA), the Marine Corps, and the Special Operations Command.

For example, my own brain imaging research, which received generous funding through this Committee in FY05, seeks to model the neurocognitive processes of lying in order to formulate new deception detection techniques using measures of specific brain activity. As a university researcher, I also collaborate with scientists conducting credibility assessment studies at the nearby DoD Polygraph Institute (DoDPI) at Ft. Jackson and the DoD Counterintelligence Field Activity (CIFA) here in Washington. Deception, and its detection, is of course at the heart of counterintelligence work, and the research collaborations with DoD are designed to bridge results from my investigations in basic psychophysiology to the more applied, mission-specific science and technology work that supports counterintelligence activities.

I would like to address the FY06 human-centered research budgets for the military laboratories and programs within the context of the larger DoD Science and Technology budget.

DoD Science and Technology Budget

The President's budget request for basic and applied research at DoD in FY06 is $10.52 billion, a 21% decrease from the enacted FY05 level and a decrease from the President's FY05 budget request. APA joins the Coalition for National Security Research (CNSR), a group of over 40 scientific associations and universities, in urging the Subcommittee to reverse this cut in support and dedicate at least three percent of total DoD spending to 6.1, 6.2 and 6.3 level research in FY06.

As our nation rises to meet the challenges of current engagements in Iraq and Afghanistan as well as other asymmetric threats and increased demand for homeland defense and infrastructure protection, enhanced battlespace awareness and warfighter protection are absolutely critical. Our ability to both foresee and immediately adapt to changing security environments will only become more vital over the next several decades. Accordingly, DoD must support basic Science and Technology (S&T) research on both the near-term readiness and modernization needs of the department and on the long-term future needs of the warfighter.

In FY 2005, the Administration requested $10.55 billion for defense S&T, less than the enacted amount in FY04. Congressional appropriators in turn provided a significant increase over both the budget request and the FY04 level, for a total of $13.33 billion. For FY06, the President's budget request of $10.52 billion for DoD S&T again fell short – of both the FY05 budget request and the FY05 enacted level (a 21% decrease).

Despite substantial appreciation for the importance of DoD S&T programs on Capitol Hill, and within independent defense science organizations such as the Defense Science Board (DSB), total research within DoD has remained essentially flat in constant dollars over the last few decades. This poses a very real threat to America's ability to maintain its competitive edge at a time when we can least afford it. APA, CNSR and our colleagues within the science and defense communities recommend funding the DoD Science and Technology Program at a level of at least three percent of total DoD spending in Fiscal Year 2006 in order to maintain global superiority in an ever-changing national security environment.

Behavioral Research within the Military Service Labs and DoD

In August, 2000 the Department of Defense met a congressional mandate to develop a Report to the Senate Appropriations Committee on *Behavioral, Cognitive and Social Science Research in the Military.* The Senate requested this evaluation due to concern over the continuing erosion of DoD's support for research on individual and group performance, leadership, communication, human-machine interfaces, and decision-making. In responding to the Committee's request, the Department found that "the requirements for maintaining strong DoD support for behavioral, cognitive and social science research capability are compelling" and that "this area of military research has historically been extremely productive" with "particularly high" return on investment and "high operational impact."

Despite the critical need for strong research in this area, the Administration has proposed an FY06 defense budget that again would slash funding for human-centered research. APA urges the Committee to, at a mimimum, restore proposed FY06 cuts to the military lab behavioral research programs.

Within DoD, the majority of behavioral, cognitive and social science is funded through the Army Research Institute (ARI) and Army Research Laboratory (ARL); the Office of Naval Research (ONR); and the Air Force Research Laboratory (AFRL). These military service laboratories provide a stable, mission-oriented focus for science, conducting and sponsoring basic (6.1), applied/exploratory development (6.2) and advanced development (6.3) research. These three levels of research are roughly parallel to the military's need to win a current war (through products in advanced development) while concurrently preparing for the next war (with technology "in the works") and the war after next (by taking advantage of ideas emerging from basic research). All of the services fund human-related research in the broad categories of personnel, training and leader development; warfighter protection, sustainment and physical performance; and system interfaces and cognitive processing.

Despite substantial appreciation for the critical role played by behavioral, cognitive and social science in national security, however, total spending on this research declined again in the President's FY06 budget. Specific human factors and manpower/personnel/training programs within the applied 6.2 and 6.3 accounts were cut in the Army, and the Navy's applied 6.2 programs in human systems and warfighter sustainment took substantial cuts. Similarly, support for the Air Force's applied 6.2 and 6.3 level human effectiveness and crew systems and personnel protection accounts were down in the President's budget request.

In addition, I know first-hand the value of supporting the smaller, but mission-critical, behavioral research programs within DoD, particularly those related to credibility assessment and detection of deception. APA encourages the Committee to increase funding for these programs.

Behavioral and cognitive research programs eliminated from the mission labs due to cuts or flat funding are extremely unlikely to be picked up by industry, which focuses on short-term, profit-driven product development. Once the expertise is gone, there is absolutely no way to "catch up" when defense mission needs for critical human-oriented research develop. As DoD noted in its own Report to the Senate Appropriations Committee:

> *"Military knowledge needs are not sufficiently like the needs of the private sector that retooling behavioral, cognitive and social science research carried out for other purposes can be expected to substitute for service-supported research, development, testing, and evaluation…our choice, therefore, is between paying for it ourselves and not having it."*

The following are brief descriptions of important behavioral research funded by the military research laboratories:

Army Research Institute for the Behavioral and Social Sciences (ARI) and Army Research Laboratory (ARL)

ARI works to build the ultimate smart weapon: the American soldier. ARI was established to conduct personnel and behavioral research on such topics as minority and general recruitment; personnel testing and evaluation; training and retraining; and attrition. ARI is the focal point and principal source of expertise for all the military services in *leadership research*, an area especially critical to the success of the military as future war-fighting and peace-keeping missions demand more rapid adaptation to changing conditions, more skill diversity in units, increased information-processing from multiple sources, and increased interaction with semi-autonomous systems. Behavioral scientists within ARI are working to help the armed forces better identify, nurture and train leaders. One effort underway is designed to help the Army identify those soldiers who will be most successful meeting 21st century noncommissioned officer job demands, thus strengthening the backbone of the service—the NCO corps.

Another line of research at ARI focuses on *optimizing cognitive readiness* under combat conditions, by developing methods to predict and mitigate the effects of stressors (such as information load and uncertainty, workload, social isolation, fatigue, and danger) on performance. As the Army moves towards its goal of becoming the Objective Force (or the Army of the future: lighter, faster and more mobile), psychological researchers will play a vital role in helping maximize

soldier performance through an understanding of cognitive, perceptual and social factors.

ARL's Human Research & Engineering Directorate sponsors basic and applied research in the area of human factors, with the goal of optimizing soldiers' interactions with Army systems. Specific behavioral research projects focus on the development of intelligent decision aids, control/display/workstation design, simulation and human modeling, and human control of automated systems.

Office of Naval Research (ONR)

The Cognitive and Neural Sciences Division (CNS) of ONR supports research to increase the understanding of complex cognitive skills in humans; aid in the development and improvement of machine vision; improve human factors engineering in new technologies; and advance the design of robotics systems. An example of CNS-supported research is the division's long-term investment in artificial intelligence research. This research has led to many useful products, including software that enables the use of *"embedded training."* Many of the Navy's operational tasks, such as recognizing and responding to threats, require complex interactions with sophisticated, computer-based systems. Embedded training allows shipboard personnel to develop and refine critical skills by practicing simulated exercises on their own workstations. Once developed, embedded training software can be loaded onto specified computer systems and delivered wherever and however it is needed.

Air Force Research Laboratory (AFRL)

Within AFRL, Air Force Office of Scientific Research (AFOSR) behavioral scientists are responsible for basic research on manpower, personnel, training and crew technology. The AFRL Human Effectiveness Directorate is responsible for more applied research relevant to an enormous number of acknowledged Air Force mission needs ranging from weapons design, to improvements in simulator technology, to improving crew survivability in combat, to faster, more powerful and less expensive training regimens.

As a result of previous cuts to the Air Force behavioral research budget, the world's premier organization devoted to personnel selection and classification (formerly housed at Brooks Air Force Base) no longer exists. This has a direct, negative impact on the Air Force's and other services' ability to efficiently identify and assign personnel (especially pilots). Similarly, reductions in support for applied research in human factors have resulted in an inability to fully enhance human factors modeling capabilities, which are essential for determining human-system requirements early in system concept development, when the most impact can be made in terms of manpower and cost savings. For example, although engineers know how to build cockpit display systems and night goggles

so that they are structurally sound, psychologists know how to design them so that people can use them safely and effectively.

Summary

On behalf of APA, I would like to express my appreciation for this opportunity to present testimony before the Subcommittee. Clearly, psychological scientists address a broad range of important issues and problems vital to our national security, with expertise in understanding and optimizing cognitive functioning, perceptual awareness, complex decision-making, stress resilience, and human-systems interactions. We urge you to support the men and women on the front lines by reversing another round of dramatic, detrimental cuts to the human-oriented research within the military laboratories, and by increasing support to behavioral research programs within DoD activities related to credibility assessment and counterintelligence.

Below is suggested appropriations report language which would encourage the Department of Defense to fully fund its behavioral research programs within the military laboratories:

Department of Defense

Research, Development, Test, and Evaluation:
Behavioral Research in the Military Service Laboratories: The Committee notes the increased demands on our military personnel, including high operational tempo, leadership and training challenges, new and ever-changing stresses on decision-making and cognitive readiness, and complex human-technology interactions. To help address these issues vital to our national security, the Committee has provided increased funding to reverse cuts to basic and applied psychological research through the military research laboratories: the Air Force Office of Scientific Research and Air Force Research Laboratory; the Army Research Institute and Army Research Laboratory; and the Office of Naval Research.

For more information please contact:
Heather O'Beirne Kelly, PhD
American Psychological Association
202.336.5932 or hkelly@apa.org