TRADOC Pam 525-3-7

The U.S. Army Human Dimension Concept

21 May 2014

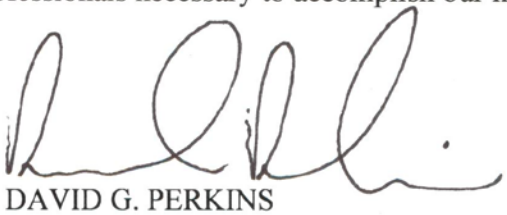
This page intentionally left blank.

From the Commanding General
U.S. Army Training and Doctrine Command

For over 238 years, the United States Army has secured the Nation by preventing conflict and, when necessary, winning its wars. We have succeeded because we are an Army of well-trained, well-educated, and well-led professionals dedicated to the Army Profession. People define our Army, and they will remain our number one capital investment. Technology is no substitute for competent and committed professionals—our Soldiers and Civilians— who are the foundation of our Army.

TRADOC Pamphlet 525-3-7 provides a framework for how we will select, develop, sustain, and transition Soldiers and Civilians for the U.S. Army. It reinforces the tenets of the Army Profession Campaign, the Army Leader Development Strategy, and the Army Learning Model. It emphasizes the need to capitalize on advances in science and technology to ensure that our Army maintains its competitive advantage. It explores the strategies required to reinforce and integrate human dimension ideas within the Army's Human Capital Enterprise. It also brings character development to the forefront, stressing the importance of Army Values through a career of service.

We want to sustain the skills earned in a decade of conflict while expanding our expertise to meet the complex challenges of the emerging security environment. To achieve this goal, we must employ innovative techniques that enable our professionals to learn faster, retain information better, and perform at even higher levels. We want to generate discussion and new ideas that will drive the changes that ensure our Army remains relevant and capable. I challenge each of you to help us develop the Army professionals necessary to accomplish our mission now and in the future.



DAVID G. PERKINS
General, U.S. Army
Commanding

This page intentionally left blank.

Department of the Army
Headquarters, United States Army
Training and Doctrine Command
Fort Eustis, Virginia 23604

***TRADOC Pamphlet 525-3-7**

21 May 2014

Military Operations

THE U.S. ARMY HUMAN DIMENSION CONCEPT

DAVID G. PERKINS
General, U.S. Army
Commanding

CHARLES E. HARRIS, III
Colonel, GS
Deputy Chief of Staff, G-6

History. This publication is a major revision of TRADOC Pamphlet 525-3-7, and also supersedes TRADOC Pamphlet 525-3-7-01. The portions affected by this major revision are listed in the summary of change.

Summary. This pamphlet describes the broad human dimension capabilities the Army will require to meet the challenges of the future operational environment. It describes and provides a guide for how the Army will use the human dimension as a common framework for adapting and enhancing the Army's effort to achieve superior warfighting effectiveness in unified land operations.

Applicability. This pamphlet applies to all Department of the Army activities that identify and develop doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) solutions to support human dimension initiatives. All active Army, Army National Guard, and Army Reserve forces may use this pamphlet to identify future human dimension trends in the Army. This pamphlet may also serve as a reference document to agencies within the joint community that work with the human dimension ideas.

*This pamphlet supersedes TRADOC Pamphlets 525-3-7, dated 11 June 2008, and 525-3-7-01, dated 1 April 2008.

Proponent and exception authority. The proponent of this pamphlet is the TRADOC Headquarters, Director, Army Capabilities Integration Center (ARCIC). The proponent has the authority to approve exceptions or waivers to this pamphlet that are consistent with controlling law and regulations. Do not supplement this pamphlet without prior approval from Director, ARCIC (ATFC-ED) 950 Jefferson Ave, Fort Eustis, VA 23604-5763.

Suggested improvements. Users are invited to submit comments and suggested improvements via the Army Suggestion Program online at https://armysuggestions.army.mil (Army Knowledge Online account required) or via DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Director, ARCIC (ATFC-ED), 950 Jefferson Ave, Fort Eustis, VA 23604-5763.

Availability. This publication is only available on the TRADOC home page at http://www.tradoc.army.mil/tpubs/.

Summary of Change
TRADOC Pamphlet 525-3-7
The U.S. Army Human Dimension Concept

This major revision, dated 21 May 2014-

o Changes title (cover page).

o Updates assumptions (para 1-4).

o Expands the scope of the concept to include all members of the Army Profession (Soldiers and Army Civilians) and supporting contractors (where applicable); character and leader development; and optimized job performance, optimized holistic health and fitness, and maximized professionals.

o Updates operational context (chap 2).

o Updates military problem, central idea, and solutions (chap 3).

o Adds glossary.

o Updates required capabilities (app B).

o Adds appendices that expand on the main ideas of the concept.

Contents

Figure List

This page intentionally left blank.

Chapter 1
Introduction

1-1. Purpose

a. The U.S. Army Human Dimension Concept provides a framework for how the future Army must select, develop, sustain, and transition Soldiers and Army Civilians to prevent, shape, and win in the 21st century. This concept redefines the parameters of the human dimension as encompassing the cognitive, physical, and social components. It includes all aspects of Soldier, Civilian, leader, and organizational development and performance essential to raise, prepare, and employ the Army in unified land operations.

b. This concept provides ideas that help synchronize and integrate personnel policies with training and education, science and technology (S&T), medical, and social science efforts to provide the Army a dynamic competitive advantage in future conflicts. Although this concept focuses on the successful execution of the Army human capital strategy for the future, the Army must begin applying solutions today. Ultimately, the Army must apply human performance optimization—the process of applying knowledge, skills, and emerging technologies to improve and preserve the capabilities of Department of Defense personnel to execute essential tasks.[1]

1-2. References

Required and related publications are listed in appendix A.

1-3. Background

a. This revision of the Human Dimension Concept supports the U.S. Army Capstone Concept's central idea of operational adaptability by providing a framework to maximize individual and team performance through the identification, development, and optimal integration of human capabilities. This concept also capitalizes on lessons learned in recent worldwide operations and through directed human dimension capability development work. It acknowledges the original research in TRADOC Pamphlet (TP) 525-3-7-01, as well as the contents of the approved Initial Capabilities Document for U.S. Army Human Dimension dated 12 June 2012 and the DOTMLPF Interim Change Recommendation dated 11 July 2013. It expands the scope of the concept to include members of the Army Civilian Corps. This revision also supports the Strategic Landpower and the Force 2025 and Beyond initiatives.

b. Strategic Landpower. In January 2013, The U.S. Army, U.S. Marine Corps, and U.S. Special Operations Command chartered the Strategic Landpower Task Force to study the future application of landpower to achieve national objectives. The subsequent May 2013 White Paper, "Strategic Landpower: Winning the Clash of Wills," identifies the requirement for rigorous analysis to determine solutions that will provide the security capabilities necessary in an era of fiscal austerity. Key aspects the Strategic Landpower Task Force will examine include:

(1) The role of land forces and how they contribute to preventing and containing conflict.

(2) The reasons why past tactical and operational successes have not always resulted in achievement of strategic objectives.

(3) The reinforcement of the necessity of integrating the understanding of achieving physical objectives with a fuller understanding of, and consideration for, identifying and achieving human objectives in the formulation and execution of strategy, operational plans, and tactical actions.

(4) The examination of the social sciences of warfare alongside the physical sciences of warfare.

c. Force 2025 and Beyond. Force 2025 and Beyond is an Army initiative that operationalizes Strategic Landpower by ensuring the future Army has the necessary capabilities to accomplish its missions. By 2025, the Army must be leaner, smarter, more lethal, and flexible. The Army must operate differently, enable forces differently, and organize differently to maintain overmatch, to respond to a myriad of threats, and to set the conditions for fundamental long-term change. To meet future challenges, the Army must adjust research, development, and investment into leaner, more mobile forces able to more easily operate in urban environments with appropriate protection and lethality. Force 2025 and Beyond is a force modernization approach that includes the near, mid, and far terms to bring about fundamental change.

(1) In the near-term (2014-2020), the investment priority will be leader development; the modernization priority remains the network.

(2) In the mid-term (2020-2030), the emphasis will be on retaining overmatch, which will require readjusting S&T investments today. Also important will be the continuation of engineering change proposals to improve equipment and the identification of technologies that will provide leaner formations with equal or greater capabilities.

(3) In the far-term (2030-2040), the goal will be to fundamentally change the Army by altering the ratio of direct combat to operational support and sustainment forces ("tooth to tail"). This change will allow for an increase in expeditionary maneuver by an operationally significant force. In addition, the focus will be on high payoff technology breakthroughs, including human sciences, material sciences, advanced decision-making, and advanced lethality.

1-4. Assumptions

a. TP 525-3-0, Army Capstone Concept (ACC) assumptions apply to this concept.

b. The following additional assumptions apply directly to this concept:

(1) The way the Army trains and educates will evolve.

(2) Army professionals will remain committed to career-long learning and self-development.

(3) Technology and the physical, medical, social, and behavioral sciences will enable enhanced human dimension capabilities.

(4) The Army will continue to subscribe to the characteristics, values, and principles of the Army Profession and Army Ethic.

(5) For the foreseeable future, the Army will operate in a climate of fiscal austerity, requiring increased efforts toward achieving innovation and efficiencies.

1-5. **Explanation of abbreviations and terms**
Abbreviations and special terms used in this pamphlet are explained in the glossary.

Chapter 2
Operational Context

2-1. The future operational environment
The future operational environment will present Army leaders with complexity. Threats will manifest themselves in combinations of regular, irregular, terrorist, and criminal elements. These threats will have access to sophisticated technologies such as robots, unmanned vehicles (aerial and ground), and possibly weapons of mass destruction. They will merge cyber and electronic warfare capabilities to enable them to operate from disparate locations. Additionally, they may hide among the people in complex terrain to thwart the Army's conventional combat overmatch. Adding to this complexity is continued urbanization and affordable access to social media. The resulting "rising velocity of human interaction" will make it more difficult to completely understand events or to predict the aftermath of any incident.[2] Army leaders may become overwhelmed with information and face multiple dilemmas in shorter periods. This complex environment will therefore require future Army professionals to perform at a higher level.

2-2. Domestic trends and implications

a. Fiscal austerity and declining U.S. military force levels will create significant challenges for the Army. Projections are for the Army to have reduced budgets and end strength, with an increased percentage of the budget devoted to personnel costs. Combined, these trends will result in a smaller force that must continue to meet an extensive set of security missions and threats.[3] As part of the Force 2025 and Beyond initiative, the Army has begun to reprioritize its science and technology (S&T) needs. Key to this reprioritization is an increased emphasis on human performance optimization.[4] As the character of conflict changes, S&T initiatives and research efforts must include a greater investment in the human and behavioral sciences such as medicine, psychology, economics, sociology, anthropology, and political science. Recent advances in these research arenas show significant promise and potential for shaping and expanding human performance and accelerating Soldier and Civilian development.

b. Finding the right S&T solutions to improve human performance while adhering to moral and ethical standards may present challenges for the future Army. How to determine what is ethical when enhancing Soldier and Army Civilian performance can be difficult since many gray areas exist. When enhancing individual capabilities, the Army must consider both the short- and long-term consequences on Army professionals, their organizations, and their Families. Compounding this problem is the possibility that hostile forces may use enhancement technologies without any regard to moral or ethical restraints.

c. Demographic trends are another concern. An estimated 75% of the U.S. youth population (age 17-24) is ineligible for military service based on today's standards.[5] Many potential recruits lack basic skills in math, reading, and writing, despite having a high school diploma.[6] Additionally, youth obesity rates have skyrocketed and participation in athletics has declined. Many young people today are less physically fit and more likely to have poor eating habits. Over the past decade, the level of physical and motor fitness among America's youth has plummeted. Reductions in scholastic physical education, cuts in interscholastic sport programs, and the pervasiveness of the sedentary lifestyle have severely affected youth fitness. Increases in youth obesity reduce the pool of those eligible to serve, while poor nutrition increases recruit attrition and injury rates.[7] All this, coupled with reduced birth rates, results in the Army having a more difficult time finding and recruiting quality Soldiers in the quantity desired.

d. In addition to the academic and physical fitness challenges cited above, the Army must also address emerging moral-ethical challenges in the recruiting population. Many scholars have noted an increase in narcissism and a decline in empathy among young Americans.[8] As it meets the recruiting challenges of the future, the Army must continue to ensure that it remains a values-based organization. It cannot compromise its ethics or lower its standards to meet a recruiting goal. Future Soldiers, as well as future Army Civilians, must continue to be men and women of character who adopt the Army Values.

e. In the past few years, the Army has addressed its human capital challenges (such as recruiting, resiliency, and injury prevention) by developing and implementing many programs and initiatives. However, these programs and initiatives are often disjointed, independent, ad hoc, or underfunded. The Army's fiscal realities and other future challenges prescribe the need for a holistic, unifying direction. A comprehensive human capital program management system is necessary to provide accountability, appropriate authorities, informed resource allocation, and proper assessment methods.

2-3. The squad

a. The squad will remain the foundation and cornerstone of the Army.[9] Advances in technology and in warfighting have given the squad leader access to more data and more firepower than ever before. To be effective, however, tactical small unit leaders must have improved situational awareness, judgment, and emotional maturity to determine if, when, and how the application of lethal force would best support the mission. In addition, the Army must consider how technological advancements for the Soldier and squad impact both cognitive and

physical loads. The Army must find the balance that optimizes performance and minimizes adverse health effects.

b. The individuals within the squad must excel at teamwork. Developing such experience and teamwork often took considerable resources including time and money, trips to firing ranges, and unit deployments to training centers. Advancements in S&T could result in effective tactical small units, formed more quickly and efficiently, with higher levels of experience in fractions of the time. In accelerating both individual professional development and unit development, the Army can realize vastly increased operational effectiveness.

Chapter 3
Meeting the Challenges

3-1. Military problem

a. Faced with a complex future OE, changing fiscal realities, and continuous engagement as part of unified land operations, the Army will require enhanced capabilities in the cognitive, physical, and social components of the human dimension. These capabilities are necessary for the future Army to win the clash of wills, become more expeditionary while retaining capability, and maintain overmatch over adversaries.

b. The Army recognizes that the American Soldier remains the most discriminately lethal force on the battlefield. In light of the future operational challenges, the Army must invest significantly in the human dimension. This investment requires a unifying, holistic vision: maximized individual and team performance through identification, development, and optimal integration of human capabilities.

3-2. Central idea

a. To address the military problem and realize this unifying, holistic vision, the Army must orient on outcomes. Outcomes describe the changes, benefits, or other positive effects that happen as a result of achieving goals and objectives. The three Human Dimension Outcomes are:[10]

(1) Optimized Job Performance. The Army will optimize the performance of each Soldier, Civilian, and team to meet the challenges of the future operational environment by achieving accelerated development; improved cognitive and physical performance; improved social and interpersonal capabilities; improved health and stamina; and optimized talent utilization.

(2) Optimized Holistic Health and Fitness. The Army will optimize the holistic health and fitness of each Soldier and Civilian[11] by achieving increased resilience; improved health fitness and physical fitness; and improved mental and emotional health and stress management.

(3) Maximized Army Professionals. The Army will maximize Army professionals by achieving accelerated ethical maturity and inculcation of Army values; improved ethical decision making and stewardship; and expanded professional certification and credentialing.

b. These three outcomes are mutually reinforcing and therefore overlap one another. For example, while improving the health fitness and physical fitness of each Soldier (within the optimized holistic health and fitness outcome), the Army must account for job-specific physical performance demands (within the optimized job performance outcome). Additionally, the Army cannot achieve improved social and interpersonal capabilities (within the optimized job performance outcome) and improved mental and emotional health (within the optimized holistic health and fitness outcome) without ensuring the inculcation of Army values and improved ethical decision making.

c. These outcomes are critical for the Army to achieve the vision. However, the Army also requires a defined process that is capable of assessing, integrating, and synchronizing its training and education, S&T, medical, and personnel policies, programs, and initiatives. A comprehensive assessment of human capital programs includes current and programmed solutions as well as future initiatives in the cognitive, physical, and social components. The intent is to ensure these programs are, or will be, ethical, effective, and efficient in achieving the defined outcomes and meeting the Army's challenges in the future OE.

d. Integration and synchronization of human capital programs demands the development of a system capable of the following:

(1) Providing a unifying, holistic direction for human capital programs.

(2) Ensuring responsibility for human dimension outcomes, with appropriate accountability, authorities, and resources.

(3) Ensuring routine assessment of human capital programs to allow for informed resource allocation decisions.

(4) Enabling Army-wide integration across agencies, DOTMLPF-P, and budget processes.

3-3. Solution synopsis: the human dimension integration framework

The human dimension integration framework (Figure 3-1)[12] offers a means for the Army to increase its focus on human development to meet future challenges. Looking through the cognitive, physical, and social lenses, Army stakeholders can apply a proper balance of development practices throughout the career lifecycle. These practices can therefore be evidence-based and coupled with technology to maximize individual and team performance through identification, development, and optimal integration of human capabilities.

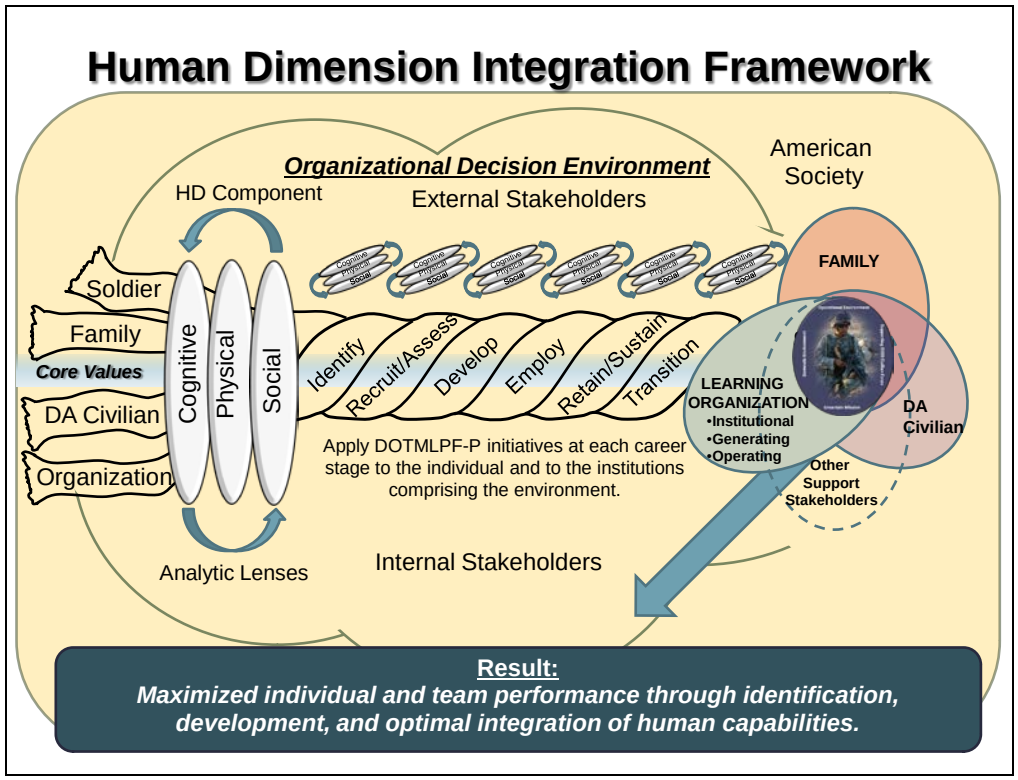


Figure 3-1. The human dimension integration framework

3-4. Components of the solution: Cognitive, physical, and social

a. The human dimension integration framework.

(1) Figure 3-1 depicts the complexity of human development within the human dimension and the interrelationships and interdependence of various factors. Soldiers, Civilians, Families, and their respective military organizations are represented as strands of a rope. Surrounding the rope are both internal and external stakeholders.[13] Internal stakeholders include the existing chain of command along with specially-trained medical, social science, and technical experts in S&T. External stakeholders include other services, academia, and the Nation. Through the center of this rope, a single strand represents Army Values: loyalty, duty, respect, selfless service, honor, integrity, and personal courage. The strands wind together over the lifecycle of each individual passing through and under the cognitive, physical, and social lenses at every stage. The application of the analytical lenses at every stage offers the Army empirical and subjective data regarding development of character and commitment of individuals and capabilities of their units and organizations. When woven together properly, users of this framework, the stakeholders, will optimize human performance.

(2) Given that the future Army will be a smaller force, assessing Soldiers and Army Civilians will become even more essential to sustaining the Army Profession and to mission accomplishment. Scientific research into how the Army and its leaders may evaluate and measure the cognitive, physical, and social components of individuals is required to enhance the moral-ethical behavior, character development, resilience, and readiness of Army professionals.

Leaders must have the tools to improve upon any identified weak areas and to enhance identified strengths. The Army must also establish a systemic process of informing leaders quickly if a Soldier or Army Civilian shows tendencies toward high-risk behaviors. Such assessments, taken at regular intervals throughout the career of a Soldier or Army Civilian, can also allow for better talent management, ensuring that the right person is in the right assignment at the right time.[14]

(3) In order to access and retain quality Soldiers and Civilians, the Army must consider their Families. Shared family values consistent with those of the Army will enhance overall commitment and performance. The Army's influence on Families is indirect; however, the perceptions and attitudes of those Family members have a great influence on Soldier and Army Civilian commitment to their respective units and organizations.[15]

b. Science will continue to shed new light on the cognitive, physical, and social components of the human dimension. The learning sciences[16] are foundational to understanding the relationship between these components. The principal purpose of enhancing capabilities in the cognitive, physical, and social components is to provide Soldiers and Army Civilians with a competitive advantage. For example, if the Army could develop a means to allow its Soldiers to alter rapidly the underlying circadian clock that impacts the ability to fall asleep and stay asleep (and, conversely, the ability to remain alert), an opposing force would need significantly more forces to counter that advantage. Taking advantage of unexpected or breakthrough technologies as they emerge will provide the Army with the best possible means to accomplish its mission. See appendix C for more information.

c. The following sections address each human dimension component—the cognitive, physical, and social—in more detail. Each component contributes to human performance optimization. Each component is also interdependent with the other components. Together, these components serve to organize the way the Army views and develops human capital.

3-5. The cognitive component

a. The cognitive component refers to the mental activity pertaining to the act or processes of perception, memory, judgment, and reasoning. Many factors influence cognition, such as the individual's traits and emotional processes. Learning, training, repetition, and practice all affect cognition, as well as physical states such as exercise, exertion, fatigue, and sleep. The cognitive component is measured in various ways such as intelligence and aptitude tests. It is a key contributor to adaptability. It supports learning, critical thinking, and rapid, effective decisionmaking in the institutional and operational Army. The cognitive component includes initiatives to accelerate learning and compress the time it takes to accumulate experiential competence.

b. Technological savvy is desirable in candidates for future recruiting and a necessary skill when training, developing, and evaluating the leadership of the future force. Assessments that identify technical aptitude will assist the Army in putting the right people onto the best professional development path and will help shape and direct individual training and education.

c. Future learners and learning.

(1) A learner-focused approach (encompassing training, education, and experience) that supports the Army's need for integrated, continuous development of learners will better meet the Army's future requirements. Future Army learners will possess unique and disparate qualities from those of today. First, future Army learners will be masters of automation and digital technology (much from pre-Army education and experience). Researchers continue to document how this changes the way people, particularly young adults, learn by enhancing the ability to handle intangibles.[17] Second, researchers predict continuing difficulty with a recruit-age population lacking basic skills (mathematics, reading, and writing at or below the 8th grade level).[18] Army leaders will therefore need to adopt different training and education methods to ensure that future Soldiers achieve at least a minimum baseline skill level.

(2) Future learning will be dynamic: a life-long knowledge accumulation and application process. Learning will have no set beginning or end as Soldiers and Army Civilians gain on-the-job experience before and after formal, institutional education opportunities. Anticipating the future complex OE, Army learning should emphasize that Army Civilians, leaders, and Soldiers progressively adapt themselves and become the agents of organizational adaptation.

d. Future learning approach. The Army will build on the current, learner-centric Army Learning Model and its continuously adaptive learning approach.[19] The future career-long continuum integrates unit training, military education, self-development, and experience into a holistic learning program that synchronizes with Army talent management. The future Army Learning Model will focus on five components:

(1) Embedding a learning expertise and culture within units.

(2) Expanding and rapidly progressing individual competencies.

(3) Strengthening and accelerating the progression to critical and creative thinking.

(4) Leveraging, encouraging, and progressing technological proficiency while technology itself progresses.

(5) Supporting leaders' building cohesive teams.

e. Adapting the current Army Learning Model to unit learning requirements ensures a close tie between what happens in learning and unit leader needs. Learning starts with baseline assessments of each individual and each unit. These assessments are reinforced over time with periodic and gateway assessments to ensure individual learning and unit learning are on track. Individual learning assessments also support tactical, operational, and strategic level talent management.

f. Direction for the learning sciences and technology. The focus here is technologies and methods to accelerate learning, experience, emotional maturity, and judgment across training domains while reducing time and expense. Included are the means, methods, and models to

assess training effectiveness for individual learners, for institutional and unit trainers, and for organizations. For example, the Army learning community can leverage advances in S&T to develop tools to mitigate the negative impacts of stress via augmented cognition.[20] Similarly, cognitive augmentation skills will be invaluable staff, faculty, and trainer development tools. See appendix C for more details.

3-6. The physical component

a. Given a smaller future Army that is more dispersed in an operational area, the pace and complexity of unified land operations will likely escalate, requiring Soldiers and deployed Army Civilians to face physical challenges that are more demanding than before. To optimize Soldier physical fitness in a more complex OE, Soldiers must become more physically adaptable and resilient. Adaptability and resilience will be critical to mission success. Attributes of adaptability include mental, interpersonal, and physical adaptability.[21]

b. To optimize performance at the individual and unit level requires a holistic approach based on all aspects of human performance. Holistic health and fitness is an approach that incorporates both the traditional aspects of physical fitness, such as aerobic capacity, strength, endurance, flexibility, and coordination, while also attending to the nutritional, psychological, and sports medicine contributions. Such a holistic approach considers the whole human and the social, moral, cognitive, and family (home life) aspects that affect physical performance.

c. The components of holistic health and fitness are health fitness (which includes health readiness, nutritional fitness, weight management, and sleep) and physical fitness. To build holistic health and fitness, the Army must become more adept at translating best practices and research into training plans, mission-ready products, and recommendations that address critical challenges to mission accomplishment. The Army's culture must reinforce holistic health and fitness as a standard for certification of professional competence. New facilities and fitness equipment may be necessary to implement such enhancements. See appendix E for additional information.

d. Holistic health and fitness is one of several keys to improve protection against environmental and mental stress and improving cognitive performance.[22] It is a complex multidimensional interrelationship that includes elements of cognitive and social well-being; health promotion and protection; nutritional fitness; hydration; weight control; sleep, rest, and recovery; and adaptation to and protection from environmental conditions. This approach requires developing an Army culture that promotes a comprehensive lifestyle of fitness and health that enhances quality of life, physical performance, and resilience. A holistic approach can reduce the incidents of injury, sickness, and disease, and promote rapid recovery and reintegration after operations that are physically and cognitively demanding. Collectively, these factors improve health and task performance and reduce the risk of cognitive, physical, and psychological breakdown. The Army's Performance Triad, which encourages a lifestyle of healthy behaviors through physical activity, nutrition, and sleep, is one program that addresses the need for a more holistic approach. See appendix D for more details.

e. The Army must ensure that both Army Civilians and Soldiers are included in a holistic health and fitness program. The benefits of holistic health and fitness include increased work productivity and reductions in lost duty days and health care costs. Holistic health and fitness should therefore be a part of the Army's overall development plan for all cohorts, Soldiers, Army Civilians, and, when necessary or appropriate, contractors.[23]

3-7. The social component

a. How Soldiers and Army Civilians interact with and are influenced by others' beliefs, behaviors, feelings, and interpersonal interactions makes up the social component. Social fitness consists of individual well-being through self-discipline, developing and maintaining trusted, valued relationships, and fostering good communication with others. People who have a richly diverse and positive social network are more resistant to the adverse effects of stress and more likely to show a resilient response or even show post-adversity growth.[24] Social fitness is closely related to emotional, spiritual, and family fitness; together with physical fitness, they comprise the five strengths of comprehensive Soldier, Family, and Army Civilian fitness.[25]

b. Soldiers and Army Civilians who demonstrate strong moral, ethical, and spiritual beliefs and a strong commitment to the Army Ethic (which includes the Army Values) are or become leaders of character. Trust, honorable service, esprit de corps, and stewardship are the essential characteristics that define the Army Profession today and will continue to be essential in fulfilling the Army's Constitutional duties to the Nation. [26] The Army must continuously develop competence, character, and commitment in Soldiers and Army Civilians so that they may establish the trust necessary to interact with other effectively.

c. The Army Ethic is the evolving set of laws, values, and beliefs. It is deeply embedded within the core of the Army culture. All members of the Army Profession, bound in a moral purpose, are responsible to motivate and guide appropriate conduct. Army professionals understand and accept the Army Ethic in both their own lives and foster it in their unit or command. Army training and education institutions and all leaders must consciously and continually assess behavior and foster adherence to a value system that causes members of the profession to intuitively do the right thing, even under the most arduous circumstances.

d. Commanders require Soldiers and Army Civilians adept at understanding the variables of political, military, economic, social, information, infrastructure, physical environment, and time (PMESII-PT). Army professionals must understand and address the human aspects of the area of operations to increase the likelihood of mission success. Developing an understanding and respect for the importance of culture is an essential element of 21st century operations with unified action partners. Such understanding is necessary for Soldiers and deployed Army Civilians to interact effectively with a broad array of entities such as other U.S. armed services, U.S. government agencies, coalition forces, humanitarian groups, host nation military and governmental organizations, and the indigenous civilian populace, among others. Leaders must therefore be skilled at team building, group dynamics, and both verbal and non-verbal communication when working with unified action partners. These skills are equally important to the Army Profession internally as the nature of America's diverse population impacts the composition of the Army in gender and cultural origins. Soldiers and Army Civilians must be

capable of interacting professionally with subordinates, peers, and leaders from a variety of cultural and ethnic backgrounds.

3-8. Army leader development

ADP 6-22, Army Leadership, provides a solid foundation for leader attributes and competencies and for understanding how leaders develop. Building on that foundation, the Army's Force 2025 and Beyond has leader development as its near-term priority. Competent, ethical leadership cannot be substituted with advanced technology or sophisticated weaponry. The Army must deliberately develop the competence, character, and commitment of all members of the Army Profession, from whom the most worthy are selected and developed as leaders. As stewards of the Army Profession, all leaders are charged with the responsibility to develop their subordinates through coaching, counseling, and mentoring. Developing leaders is critical to building cohesive, resilient, effective, ethical, and efficient organizations, whether deployed on an operation or in an institutional environment. The Army Leader Development Strategy[27] recognizes those realities and provides the way ahead to re-balance the three crucial professional development components of training, education, and experience. Human dimension integration efforts must be integrated with the provisions of that strategy.

3-9. Stress and resiliency

The Army must accelerate its efforts to understand the effects of acute and chronic stress. Soldiers and Army Civilians who are physically fit, cognitively ready, and socially, emotionally, spiritually, and morally fit maintain a strong commitment to the profession while being more resilient to the effects of prolonged exposure to stress. Thus, it is critical that individuals and units understand how stress affects their performance and how to master techniques that optimize performance. See appendix D for more detail on stress and resiliency.

3-10. The Army Civilian Corps

a. As the Army prepares its Soldiers for an uncertain future, it must also prepare its Civilians. The Army Civilian Corps is about 23 percent of the total Army force, totaling more than 300,000 personnel serving in almost 500 unique job series both in the United States and abroad. In 2013, the Assistant Secretary of the Army (ASA) Manpower & Reserve Affairs (M&RA) chartered the Army Civilian Workforce Transformation to look at existing civilian workforce programs and offer recommendations and modifications. The intent is to realize a civilian workforce management program capable of attracting and retaining top talent and preparing the workforce to succeed in leadership positions throughout the Army. The initiative is aimed at improving Civilian professional development and opportunities so that the Army Civilian Corps will remain values-based. Accomplishments to date include the Army Career Tracker and the Army Senior Enterprise Talent Management Program.[28]

b. Given a smaller future Army, Army Civilians will likely become more important than ever before to mission accomplishment. Army Civilians must better understand tactical and operational requirements to appreciate how their efforts in such areas as policy, equipment fielding, and research and development impact the Soldier on the battlefield. Access and completion of Civilian Education System (CES) courses improves competence (knowledge,

innovation, and collaboration) and leader development, and needs to affect a larger percentage of the Army Civilian Corps.[29]

Chapter 4
Conclusion

a. The future OE, with its complex threats and increased tempo, will demand that future Army professionals be comfortable with uncertainty, be able to adapt quickly to fast-paced events, and possess emotional maturity and professional judgment in decisionmaking. Domestic trends indicate reduced end strength for the Army and a smaller budget, but no reduction in the expectation for the Army to continue to be the principal contributor to landpower in support of U.S. national security interests. Additionally, the Army will face challenges in identifying and recruiting quality Soldiers and Army Civilians in the quantity needed.

b. Faced with these realities, the Army will require enhanced capabilities in the cognitive, physical, and social components of the human dimension. The vision is maximized individual and team performance through the identification, development, and optimal integration of human capabilities. The Army must therefore assess, integrate, and synchronize its training and education, S&T, medical, and personnel policies, programs, and initiatives. Increased and focused investment in the human dimension, guided by the vision, will ensure that these efforts are ethical, effective, and efficient in meeting the Army's present and future challenges.

Appendix A
References

Army regulations, Department of the Army (DA) pamphlets, field manuals (FM), Army doctrine publications (ADP), Army doctrine reference publications (ADRP), and DA forms are available at Army Publishing Directorate Home Page http://www.apd.army.mil. TRADOC publications and forms are available at TRADOC Publications at http://www.tradoc.army.mil/tpubs. Joint pubs are available on the Joint Electronic Library at http://www.dtic.mil/doctrine/new_pubs/jointpub_operations.htm or https://jdeis.js.mil/jdeis/index.jsp?pindex=0.

Section I
Required References

None

Section II
Related References

ADP 1
The Army

ADP 3-0
Unified Land Operations

ADP 6-0
Mission Command

ADP 6-22
Army Leadership

ADRP 1
The Army Profession

ADRP 3-0
Unified Land Operations

ADRP 6-0
Mission Command

ADRP 6-22
Army Leadership

Aquino, K., & Reed II, A. (2002). The self-importance of moral identity. *Journal of personality and social psychology*, *83*(6), 1423.

Bergeron, M. F., Nindl, B. C., Deuster, P. A., Baumgartner, N., Kane, S. F., Kraemer, W. J., & O'Connor, F. G. (2011). Consortium for Health and Military Performance and American College of Sports Medicine consensus paper on extreme conditioning programs in military personnel. *Current sports medicine reports*, *10*(6), 383-389.

Bicksler, B. A., & Nolan, L. G. (2009). Recruiting an all-volunteer force: The need for sustained investment in recruiting resources—An update. *Strategic Analysis*.

Brinsfield, J.W. (2002). "Reality Check: The Human and Spiritual Needs of Soldiers and How to Prepare them for Combat." in Snider, D. M. and Watkins, G. L. *The Future of the Army Profession.* Boston: McGraw-Hill Primis Custom Publishing.

Brown, M. E., Treviño, L. K., & Harrison, D. A. (2005). Ethical leadership: A social learning perspective for construct development and testing. *Organizational Behavior and Human Decision Processes*, *97*(2), 117-134.

Bukalo, O., Campanac, E., Hoffman, D. A., & Fields, R. D. (2013). Synaptic plasticity by antidromic firing during hippocampal network oscillations. *Proceedings of the National Academy of Sciences*, *110*(13), 5175-5180.

Card, S. K., Moran, T. P., & Newell, A. (1983). The Psychology of Human-Computer Interaction.

Davy, J., & Göbel, M. (2013). The effects of a self-selected nap opportunity on the psychophysiological, performance and subjective measures during a simulated industrial night shift regimen. *Ergonomics*, *56*(2), 220-234.

Department of the Army. (2013, June 5). Army Leader Development Strategy 2013

Edens, E. N., Riviere, L. A., Hoge, C. W., & Bliese, P. D. (2010). To stay or not to stay? Family-friendly unit climate and career intentions. *The 71F Advantage*, 395.

FM 4-02.51
Combat and Operational Stress Control

FM 6-22.5
Combat and Operational Stress Control Manual for Leaders and Soldiers

Flynn, J. R. (2012). *Are We Getting Smarter?: Rising IQ in the Twenty-first Century*. Cambridge University Press.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. *Journal of personality and social psychology*, *50*(5), 992.

Friedl, K., Deuster, P. A., O'Connor, F. G., Henry, K. A., Martindale, V. E., Talbot, L., & Jonas, W. (2007). Human Performance Optimization: An Evolving Charge to the Department of Defense. *Military Medicine*, *172*, 1133-1137.

Girardeau, G., & Zugaro, M. (2011). Hippocampal ripples and memory consolidation. *Current Opinion in Neurobiology*, *21*(3), 452-459.

Hannah, S. T., & Avolio, B. J. (2011). Leader character, ethos, and virtue: Individual and collective considerations. *The Leadership Quarterly*, *22*(5), 989-994.

Hannah, S. T., Campbell, D. J., & Matthews, M. D. (2010). Advancing a research agenda for leadership in dangerous contexts. *Military Psychology*, *22*, S157-S189.

Hinds, P. J., & Mortensen, M. (2005). Understanding conflict in geographically distributed teams: The moderating effects of shared identity, shared context, and spontaneous communication. *Organization science*, *16*(3), 290-307.

Hofmann, D. A., & Jones, L. M. (2005). Leadership, collective personality, and performance. *Journal of Applied Psychology*, *90*(3), 509.

Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, *191*(1), 36-43.

Kaspersen, M., Matthiesen, S. B., & Götestam, K. G. (2003). Social network as a moderator in the relation between trauma exposure and trauma reaction: A survey among UN soldiers and relief workers. *Scandinavian journal of psychology*, *44*(5), 415-423.

Kotch, K. (2010). Human Performance Optimization: Maximizing the Capability of Our Warfighters. *Force Health Protection and Readiness*, 5(3), 9-10.

Lee, S. H., & Dan, Y. (2012). Neuromodulation of brain states. *Neuron*, *76*(1), 209-222.

Lombardi, D. A., Jin, K., Courtney, T. K., Arlinghaus, A., Folkard, S., Liang, Y., & Perry, M. J. (2013). The effects of rest breaks, work shift start time, and sleep on the onset of severe injury among workers in the People's Republic of China. *Scandinavian journal of work, environment & health*. Epub ahead of print doi: 10.5271/sjweh.3395.

Loten, A., *Younger Employees Lack Basic Skills,* Inc. (Online), accessed on 19NOV12, at: http://www.inc.com/news/articles/200610/workforce.html

Masi, R., Wong, A., Boon, J. E., Schirmer, P., & Sollinger, J. M. (2009). *Supporting the US Army Human Resources Command's Human Capital Strategic Planning*. RAND Corporation.

Musick, M. R., Scott, R. M., & Winkelman, D., *Omaha Youth: Ready, Willing but Unable to Serve*, Mission: Readiness, 11 October 2012 (Online), accessed and retrieved on 21November 12, at: http://www.missionreadiness.org/2012/new-report-most-young-adults-in-omaha-and-statewide-lack-basic-skills-and-qualifications-to-serve-in-military/

Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA: the journal of the American Medical Association*, *295*(13), 1549-1555.

Power, F. C., & Higgins-D'Alessandro, A. (2008). The just community approach to moral education and the moral atmosphere of the school. *Handbook of moral and character education*, 230-247.

Public Law 96-303

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: development of a taxonomy of adaptive performance. *Journal of Applied Psychology*, *85*(4), 612.

Rona, R. J., Jones, M., Fear, N. T., Hull, L., Hotopf, M., & Wessely, S. (2010). Alcohol misuse and functional impairment in the UK Armed Forces: A population-based study. *Drug and alcohol dependence*, *108*(1), 37-42.

Roy, T. C., Springer, B. A., McNulty, V., & Butler, N. L. (2010). Physical fitness. *Military Medicine*, *175*(Supplement 1), 14-20.

Sandi, C., & Pinelo-Nava, M. T. (2007). Stress and memory: behavioral effects and neurobiological mechanisms. *Neural plasticity, 2007*.

Shay, J. (2010, November). Moral Leadership Prevents Moral Injury. In *Symposium Report* (p. 313).

Spiering, B. A., Walker, L. A., Hendrickson, N. R., Simpson, K., Harman, E. A., Allison, S. C., & Sharp, Marilyn A.; (2012). Reliability of Military-Relevant Tests Designed to Assess Soldier Readiness for Occupational and Combat-Related Duties. *Military Medicine,* 177, 663-668.

Sweeney, P. J., & Fry, L. W. (2012). Character development through spiritual leadership. *Consulting Psychology Journal: Practice and Research*, *64*(2), 89.

Training Circular 3-22.20
Army Physical Readiness Training

TP 525-3-0
The U.S. Army Capstone Concept

TP 525-3-3
The U.S. Army Functional Concept for Mission Command 2016-2028

TRADOC G-2. (2012, August). Operational Environments to 2028: The Strategic Environment for Unified Land Operations. Available by request from proponent.

Treviño, L. K., Weaver, G. R., & Reynolds, S. J. (2006). Behavioral ethics in organizations: A review. *Journal of management*, *32*(6), 951-990.

U.S. Army Accessions Command. (2009). *Strong Students, Strong Futures, Strong Nations, A US Army Whitepaper*, pg 12-13. Washington, DC: Retrieved on 21NOV12 from http://www.guidanceconsortium.com/pdf-files-military/ConferenceDocs/US-ArmyEducationWhitePaper.pdf

United States Army, United States Marine Corps, and the United States Special Operations Command. (28 Oct 2013). *Strategic Landpower: Winning the Clash of Wills.* Retrieved 8 April 2014 from http://www.arcic.army.mil/app_Documents/Strategic-Landpower-White-Paper-28OCT2013.pdf.

United States Army, *Army Vision - Force 2025 White Paper*, 23 January 2014. Retrieved 8 April 2014 from http://www.arcic.army.mil/app_Documents/USArmy_WhitePaper_Army-Vision-Force-2025_23JAN2014.pdf.

Vago, D. R., & Silbersweig, D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in human neuroscience*, *6*.

Vander Weg, M. W., Klesges, R. C., & DeBon, M. (2005). Relationship between smokeless tobacco use and body weight in young adult military recruits. *Nicotine & tobacco research*, *7*(2), 301-305.

Vandergriff, D. E. (2002). *The Path to Victory: America's Army and the Revolution in Human Affairs*. Presidio Press.

Wilcox, V. L. (1994). "Burnout in Military Personnel." In Jones, F. D. et al. *Military Psychiatry: Preparing for Peace for War.* Washington, DC: Borden Institute, U.S. Army Medical Department Center & School, U.S. Government Printing Office, pp. 31-49.

Appendix B
Key required capabilities (RC)

This appendix identifies new, revised, and interdependent RCs required to support human dimension in the future OE. These RCs reflect requirements generated from the key ideas in this concept (level 1) and dependencies to or from another concept or approved document (level 2).[30]

B-1. Human dimension RCs from the ACC

The future Army requires increased military and social competence by its leaders and Soldiers, raising physical and cognitive excellence to gain advantage and maximize investments in them. (ACC B-9)

B-2. Level 1 RCs

a. Future Army organizations require the capability to integrate and synchronize human dimension initiatives (training and education, science and technology, medical, and personnel policies, programs, and initiatives) to ensure they are effective and efficient in providing adaptable, trained, and resilient forces that meet the Army's challenges in the future operational environment.

b. Future Army organizations require the capability to use cognitive, physical, and social assessments that measure abilities and accurately predict future success of members of the Army Profession to implement enhanced talent management so the right person receives the right career assignment (to include training and education) at the right time.

c. Future Army organizations require the capability to conduct assessments to determine cognitive abilities (baseline and subsequent) throughout the career lifecycle and to provide tools to improve identified weak areas and sustain identified strengths to support the cognitive development of members of the Army Profession.

d. Future Army organizations require the capability to conduct assessments to determine physical abilities (baseline and subsequent) throughout the career lifecycle and to provide tools to improve identified weak areas and sustain identified strengths to support the holistic health and fitness of members of the Army Profession.

e. Future Army forces require a comprehensive physical fitness training system that educates, trains, and inspires Soldiers, leaders, and Army Civilians to improve both general physical fitness and functional fitness, to reduce the risk of injury, and to optimize individual and team performance.

f. Future Army forces require a comprehensive physical fitness performance pre-assessment, participation in a guided physical readiness program, and a prerequisite physical assessment to ensure that prospective recruits meet the minimum standard baseline for health and fitness necessary in the future operational environment.

g. Future Army forces require the ability to assess individual and unit physical readiness for the physical demands of common soldiering tasks, each Soldier's military occupational specialty tasks, and the unit's specific tasks to predict Soldier and unit ability to perform mission essential tasks.

h. Future Army organizations require the capability to conduct assessments to determine social abilities (baseline and subsequent) throughout the career lifecycle and to provide tools to improve identified weak areas and sustain identified strengths to provide for improved adaptability, commitment to the Army Ethic, character development, and skills to interact effectively with others.

i. Future Army organizations require the capability to conduct assessments throughout the career lifecycle to certify Army professionals in competence, character, and commitment to lead, train, educate, and mentor subordinates.

j. Future Army organizations require the capability to accelerate the learning, experience, and professional development of Army professionals so that individuals can perform at levels higher than those of Soldiers and Army Civilians today.

k. Future Army organizations require the capability to manage individual talent throughout the lifecycle through an integrated approach leveraging accessions, retention, professional development, and assignment strategies to ensure optimal employment of all members of the Army profession.

l. Future Army organizations require assessment tools tailored to individual expected outcomes within the institutional and self-development training domains and to rapidly assess the effectiveness of individual development within the operational training domain, providing leaders and learners the certainty that learning occurred to standard.

m. Future Army organizations require the capability to develop Army professionals adept at formulating, comprehending, and applying understanding of the political, military, economic, social, information, infrastructure, physical environment, and time (PMESII-PT) variables to all aspects of operations.

n. Future Army forces require the capability to enhance individual and unit resiliency and to resist the negative effects of prolonged exposure to stress to increase individual and unit effectiveness.

o. Future Army forces require the capability to train and educate leaders, Soldiers, and Army Civilians using the Continuous Adaptive Learning Model that develops the initial, functional, and professional skills, knowledge, and attributes to provide the fundamental tactical, technical, cultural, and geo-political competence necessary to conduct decisive action in support of unified land operations (ACC, B-8a)

p. The future Army requires the capability to provide critical and creative thinking leaders at all echelons with highly refined problem solving skills that assist in processing data and information into usable knowledge to develop strategic thinkers. (ACC, B-8b)

Appendix C
Science and Technology

C-1. S&T and human performance optimization

a. There is a pressing need for social science and related medical research, experimentation, and studies to support human performance optimization and to help realize the Army's future vision.[31] The goals of human performance optimization include optimizing and sustaining mental and physical performance and resilience; reducing injury; decreasing the incidence of illness; and accelerating recovery.[32]

b. Technological efforts and techniques to optimize human performance aim to enable sustained peak performance over longer time periods. In the near future, such enhancements will include cognitive and exoskeleton augmentation, medications, and psychological behavior modifications. In the longer term, advanced capabilities such as gene manipulation may improve human performance while nanotech implants could increase efficiency of the physical processes. S&T advancements that allow accelerated learning, experience, and judgment could result in developing quality leaders faster and in retaining those quality leaders.

c. Future mission command systems may overload the cognitive abilities of Soldiers and leaders. Advanced computer technologies must therefore provide significant assistance to future decisionmaking. Requirements include providing improved training for decisionmakers, improved forms of communication and coordination, external memory or perceptual aids, enhanced access to relevant data and information, and decision support systems in which the computer is an active participant in the problem solving and decisionmaking process. Bio-enabled computing power can facilitate mind-mapping techniques to enhance the efficiency and effectiveness of computer-assisted decisionmaking. Such advancements could enable individuals and small groups to achieve unprecedented performance by rapidly processing information, making sound decisions, and taking decisive action.

C-2. S&T to support learning

a. The Army requires technologies and methods to accelerate the learning and experience of its Soldiers, Civilians, and leaders. Included in this requirement are the means, methods, and models to assess training effectiveness for individual learners, for institutional and unit trainers,

and for organizations. This process requires a front-end performance analysis to identify the gap between the present level of performance (the baseline) and the desired level, and a thorough analysis of the reasons for the gap.[33]

b. Near term priorities will emphasize several aspects of accessing qualified personnel and of training assessments. Three of these priorities are: an assessment of experience and learning that occurred before entry into the Army and outside of the Army schoolhouse; the identification of bio-markers to identify physiological, sociological, or psychological predispositions that inhibit learning, decisionmaking, and leadership; and assessment to determine the best military occupational specialty (MOS) or branch for the recruit.[34] Parallel

efforts will deal with the means to mitigate potential Army future Soldiers who lack basic skills, knowledge, holistic health and fitness, or foundational moral-ethical values.[35]

c. Long term priorities will focus on ways to accelerate learning and increase memory function and resilience. Candidates for further exploration include an improved understanding of the relationship between stress and learning, memory function, judgment, and decisionmaking. Other efforts could identify new technologies (tools and methods) that enhance or focus training to optimize learning experiences by learning faster and remembering longer. Lastly, efforts could identify technologies that assess, rejuvenate, and augment the cognitive health and resilience of Soldiers and Army Civilians with impaired cognitive and memory functions.

Appendix D
Stress and Resiliency

D-1. Introduction

Mitigating stress is not a new challenge. Current challenges are evident in the high rates of post-traumatic stress disorder and suicide within all services over a decade of continuous conflict. Preparing Soldiers and Army Civilians to address the negative effects of stress, providing them the means to identify individual susceptibility, and conducting dedicated training and education in realistic exercises will strengthen individual resilience and assist in preventing stress related casualties.

D-2. Stress

a. No matter how well the Army recruits, trains, and prepares its Soldiers and Army Civilians for deployment, the physical and mental demands along with the privations associated with prolonged deployments can result in reduced effectiveness. Stress—particularly that associated with combat—can wear down individual morale and reduce unit effectiveness. Because combat

stress represents one of the more extreme conditions Soldiers experience in war, its effects may last long after redeployment to home station. The impact of stress on Army professionals, whether deployed or in the workplace, can go unnoticed if the leadership is not attuned to its personnel. Stress is deleterious to learning and human performance as a result of its effect on cognition and memory.[36] The Army must therefore equip Soldiers, leaders, and Army Civilians with the ability to identify when environmental demands become unbalanced with individual coping resources, and then apply solutions to mitigate the negative effects of stress.[37]

b. Families experience increased stress because of prolonged and repeated deployments and training separations. This strain degrades the ability of the Soldier and Army Civilian to maintain focus on the mission at hand. While most Soldiers and their Families learn to cope with the effects of stress, whatever the source, its effects are cumulative and can remain hidden for extended periods. The Army will continue to require strong family readiness groups and family support programs to assist in preventing the negative effects of stress and to provide support services for those who suffer from those effects.

c. Fitness, nutrition, hydration, and adequate sleep protects against the stress from casualties, uncertainty, and physical exertion. In addition, biofeedback, imagery, meditation, energy management, and attention control are stress relief techniques that may enhance performance and can be trained at most installations. Attention to holistic health and fitness is a key factor in building and sustaining resilience. Such attention supports the morale, cohesion, and esprit de corps necessary to motivate deployed Soldiers and Army Civilians, sustaining their winning spirit and protecting them from physiological or psychological breakdown.

D-3. Operational adaptability to reduce combat stress reactions (CSRs)

a. Soldiers and leaders must understand how to assist in developing strategies, techniques, and processes to cope more effectively with the stress associated with realistic training and military operations. FM 6-22.5 provides risk factors (stressors) and suggested preventive measures and leader actions. It also provides information on warrior resiliency and combat and operational stress control. Similarly, FM 4-02.51 describes the functions and operations of each combat and operational stress control element within an area of operations.

b. However, further research is needed to develop improved capability to identify those more susceptible to the effects of stress. Equipped with better information and resources, leaders will tailor training and task assignments for those individuals, thus increasing their ability to avoid or resist stress-induced trauma.

c. The risk for CSR increases when enduring prolonged and intense stressors that deplete coping resources. When the reality of combat or operations overwhelms the Soldier, it often creates a sense of helplessness, fear, and isolation. Leaders in combat theaters require the capability to identify stress levels in individual Soldiers and units, and then react appropriately. Current coping tools available include professional counseling, unit care, adequate sleep, proper nutrition, and exercise. However, future research is needed to develop additional capabilities to identify risk and restore individual or unit resilience.

d. Soldiers and Army Civilians engaged in military operations may witness horrific events. Casualties caused by CSR can result from a single traumatic event or prolonged exposure to combat. If unattended, the number of psychological casualties can be higher than the number of wounded or killed in action. There is also the danger of long-term stress or post-combat stress reactions. Together these effects extend beyond those in theater, and may shape the lives of family, friends, and communities.

e. All members of the Army Profession require emotional, cognitive, and behavioral control over the symptoms of stress.[38] It is common for individuals to experience fear, hopelessness, mood swings, and anger. These are emotional reactions to the horrors of war. Studies on post-traumatic stress have found a high correlation between Soldiers who participated in or witnessed an act that conflicted with personal core values and a negative reaction to stress.[39] Possible negative reactions include withdrawal from others, emotional numbness, anxiety, lack of cohesion, misconduct, ethical lapses, morale issues, and other behavioral anomalies.[40]

D-4. Burnout

a. The stresses experienced by Army Soldiers, Civilians, and Families resulting from over a decade of war pose a threat to morale, cohesion, and unit effectiveness. Complicating leaders' efforts to build cohesion is burnout: the emotional exhaustion, interpersonal insensitivity, and diminished sense of personal accomplishment that occurs after prolonged exposure to stress. The root cause of burnout can be traced to insufficient sleep, since sleep is required for the individual to be able to effectively manage time, plan, endure training, and regulate emotional responses to family and work stressors.

b. As burnout develops, the ability to cope with stress erodes. Personnel feel psychologically drained, emotionally exhausted, and incapable of dealing with additional stress. The signs and symptoms of burnout and CSR are similar. The differences are quantitative rather than

qualitative, diverging in the intensity of the stressor and the stressor response.[41] Burnout causes include: poor time management; poorly planned, executed, or irrelevant training; inadequate time to complete tasks to standard; and competing demands between work and family responsibilities.

c. Burnout prevention involves the same approach as CSR: exercise, sleep, nutrition, and competent and caring leaders.[42] As Army Civilians and support contractors deploy and fill positions in the generating force, they too have been and will be subject to the effects of stress and potential burnout.

Appendix E
Holistic Health and Fitness

E-1. Introduction

a. To ensure that Soldiers meet physical requisites for combat effectiveness, the Army must change its approach to a more holistic health and fitness model. Developing holistic health and fitness for members of the Army Profession requires that the Army clearly define fitness; determine how it assesses individual and unit measures; develop monitoring strategies to detect and prevent decreases in physical performance; identify how to apply requirements to all members; identify training requirements; and identify the desired end state.

b. Future unified land operations will require Soldiers, Army Civilians, deploying contractors, and units to possess the highest levels of individual and collective physical readiness to adapt to myriad stressors generated by the intensity and duration of the mission. By identifying and assessing environmental stressors, the Army can improve physical preparedness and resilience, reduce adjustment time, and advance the process of reintegration and optimal functioning upon return from deployment or post-injury. This requires the capability to provide a healthy and fit force through effectively training, monitoring, evaluating, and predicting Soldier physical readiness, and countering factors that degrade Soldier physical readiness. Lessons learned from recent conflicts have shown that it is imperative that deploying Army Civilians be holistically fit to perform their duties and not become a liability.

c. The ambiguity of future operations introduces another factor—physical adaptability. Soldiers cannot anticipate every mission contingency. Addressing this ambiguity requires cognitive flexibility reliant upon physical and mental fitness. Research demonstrates that physical adaptation results from improved health and physical fitness that enhances physical performance; mental, emotional, and physical resilience; cognitive function; and resistance to stress.[43] Soldiers, Army Civilians, and contractors performing arduous tasks may need an elite athlete's level of physical readiness.

E-2. Health fitness

a. As one of the two components of holistic health and fitness, health fitness includes health readiness, nutritional fitness, weight management, and sleep. The Army must also consider behavioral health since it affects physical readiness in both health fitness and physical fitness.

b. Nutritional fitness enhances performance, prevents illness, and contributes to holistic health and fitness. Proper nutrition requires a partnership between commanders and individuals to optimize diet quality and quantity and proper eating behavior. Daily fluid, nutrient, and energy requirements to sustain optimal physical and cognitive performance differ by body mass, activity levels, age, gender, and environment.

c. Behavioral health includes mental health and substance abuse avoidance. The use and abuse of alcohol, drugs (including prescription), and tobacco can adversely impact physical and cognitive performance.[44] Substance abuse degrades health and leads to increased injury rates, health care costs, absenteeism, and disciplinary action.

d. Sleep and recovery.

(1) Evidence shows that sleep, rest, and recovery significantly improve human performance and resilience.[45] Leaders and health care professionals must partner to evaluate and monitor fatigue and develop methods for countering its effects before Soldiers become or cause casualties. This approach stresses prevention over treatment and requires the Army to develop a comprehensive assessment of health fitness measures and related behaviors. Many negative behavior symptoms result from chronic insufficient sleep since sleep is a physiological requirement for the brain to maintain optimal cognitive effectiveness and emotional regulation. Although sleep requirements differ for each individual, the vast majority of adults require 7-8 hours of sleep every 24 hours to maintain effectiveness.

(2) The Army must leverage existing technologies and capabilities that allow for accurate and continuous measurement of sleep and wake activity, and then translation of this sleep and wake activity into an actionable metric of effectiveness. Leaders could therefore know how much sleep each individual is obtaining and the operational implications. Without adequate sleep, a Soldier's mental edge degrades—the Soldier takes longer to make decisions, may not recognize a failed solution, and may fail to appreciate and thus execute the commander's intent. A Soldier who has not obtained sufficient sleep also is likely to become careless, appear less motivated, appear less sensitive to others, express irritability, demonstrate a lack of self-control, and have difficulty overcoming sleepiness while on duty.[46] Research has also found that lack of sleep degrades ethical decisionmaking.[47]

(3) In addition to sufficient sleep, adequate rest and recovery are critical. Rest is often referred to as "quiet wakefulness"; during this time specific cellular mechanisms are activated which may positively affect cognitive and physical performance. Recovery, a multidimensional process dependent on the replenishment of energy substrates and nutrients, is viewed as the "window" in which biological systems are returned to a state of homeostasis following strenuous physical and cognitive demands. Recovery facilitates anabolic and metabolic processing (such as glycogen re-synthesis and protein synthesis), restoration of homeostasis, and autonomic nervous system rebalance. A restful state, albeit different from sleep, provides unique benefits since it is a time when metabolic and other biologic demands are low. Rest is also critical for allowing the body to recover from physical exertion and cognitive and mental requirements. During rest, sensory input is reduced and cellular processes that enhance learning and memory are activated when the brain is not processing external input.[48] Research suggests that although the cellular mechanisms involved during rest and sleep may differ, they are complementary and both contribute to memory encoding and consolidation.[49]

e. Engaging in other quiet behaviors, such as meditation and mindfulness practice, may also be associated with favorable changes in learning and memory, emotion regulation, and the ability to shift perception while reducing anxiety and depression.[50] In addition, research suggests that rest breaks of any duration may significantly delay the onset

of work related injuries.[51] The Army must leverage existing and future research to better understand the different roles that sleep, rest, and recovery serve to ensure that personnel are operating at optimal cognitive and physical capacity.

f. Health fitness also applies to Army Civilians. Health readiness, nutritional fitness, weight management, substance abuse, and sleep all impact Army Civilian job performance, health care costs, and absenteeism. For Army Civilians deploying into operational theaters, pre-deployment preparation and training must include a holistic health and fitness assessment in all components of health fitness and selected areas of physical fitness. Proper follow-up assessments after deployment are required as well.

E-3. Physical fitness

a. The contributions of physical fitness to combat performance are irrefutable. High levels of physical conditioning provide Soldiers with four significant performance advantages: improved health and increased functional fitness; greater mental toughness and perseverance (will to win); a lower risk of injury and higher resistance to illness; and, sustained cognitive performance despite stress and fatigue. Research has consistently demonstrated the benefits of physical fitness on health, well-being, and cognitive function. Recent combat experience continues to validate the role physical fitness plays in mitigating combat stress.[52]

b. Physical fitness consists of two categories: general physical fitness that contributes to well-being (known as foundational or fundamental fitness), and mission physical fitness related to mission task performance (known as functional fitness). General physical fitness is the level considered healthy in a medical sense. Important within general fitness is the capacity (strength, endurance, and mobility) to execute job-related tasks. Functional fitness, which is performance related, builds on general fitness and is the ability to perform tasks to an

established standard through integration of the components of strength, endurance, and mobility. The ability to perform requires coordination, balance, and appropriate movement to accomplish unit missions successfully.[53]

c. General fitness requirements apply to all members of the Army Profession, albeit at different levels. Functional fitness is more complex. The objective of functional fitness training is to maximize performance of common Soldier, MOS, and unit mission essential tasks.[54]

d. Optimizing physical fitness requires a comprehensive physical fitness training system that educates, trains, and inspires Soldiers and leaders to improve both fitness categories to develop optimal warrior mobility. Warrior mobility includes:

(1) Structural work capacity—optimizing the framework for mobility, musculoskeletal development, and injury prevention.

(2) Movement capacity—optimizing agility, range of motion, quickness, dynamic balance, and movement skills.

(3) Physical work capacity—improving strength, power, endurance, speed, and stamina to increase work intensity, load, and duration.

e. The Army must review and validate its current physical fitness policies for individual and collective training, school selection, entrance requirements, retention, promotion, and assignment criteria to ensure synchronization of Army requirements with future Soldier and Army Civilian needs across their life-cycles.

Glossary

Section I
Abbreviations

ACC	Army Capstone Concept
ADP	Army doctrine publication
ADRP	Army doctrine research publication
CES	Civilian Education System
CSR	combat stress reactions
DA	Department of the Army
DOTMLPF	doctrine, organizations, training, materiel, leadership and education, personnel, and facilities
DOTMLPF-P	doctrine, organizations, training, materiel, leadership and education, personnel, facilities, and policy
IET	initial entry training
METL	mission essential task list
MOS	military occupational specialty
OE	operational environment
PMESII-PT	political, military, economic, social, information, infrastructure, physical environment, and time
RC	required capability
S&T	science and technology
TP	TRADOC Pamphlet
TRADOC	Training and Doctrine Command
U.S.	United States

Section II
Terms

Army Civilian Corps
Non-uniformed Department of the Army Civilian members of the Army Profession. (ADRP 1)

Army Ethic
Evolving set of laws, values, and beliefs, deeply embedded within the core of the Army culture and practiced by all members of the Army Profession to motivate and guide the appropriate conduct of individual members bound together in common moral purpose. (ADRP 1)

Army Profession
A unique vocation of experts certified in the design, generation, support, and ethical application of landpower, serving under civilian authority and entrusted to defend the Constitution and the rights and interests of the American people. (ADRP 1)

Army professional
A member of the Army Profession who meets the Army's certification criteria of competence, character, and commitment. (ADRP 1)

certification
Verification and validation of competence, character, and commitment to fulfill responsibilities and perform assigned duties with discipline and to standards. (ADRP 1)

character
An Army professional's dedication and adherence to the Army Values and the profession's ethic as consistently and faithfully demonstrated in decisions and actions. (ADRP 1)

cognitive component
States, traits, and processes that make up subjective experience, and include typical ways of problem solving, framing events in life, intelligence, and emotional self-regulation.

cohesion
The bonding together of members of an organization through shared experiences in such a way as to sustain will and commitment to each other, their unit, and the mission.

combat stress reactions
Expected, predictable, emotional, intellectual, physical, and/or behavioral reactions of service members who are exposed to stressful events in combat or other demanding operations.

commitment
The resolve to contribute honorable service to the Nation, perform their duties successfully with discipline and to standard, and strive to successfully and ethically accomplish the mission despite adversity, obstacles, and challenges. (ADRP 1)

competence
Demonstrated ability to perform duties successfully and to accomplish the mission with discipline and to standard. (ADRP 1)

ethos
Indispensable but intangible motivating spirit of Army professionals committed to the Army Ethic. (ADRP 1)

holistic health and fitness
Incorporates both the traditional aspects of physical fitness, along with nutritional, psychological, and sports medicine contributions for optimal physical performance.

human dimension
The cognitive, physical, and social components of Soldier, Army Civilian, leader, and organizational development and performance essential to raise, prepare, and employ the Army in unified land operations.

human performance optimization
The process of applying knowledge, skills, and emerging technologies to improve and preserve the capabilities of Department of Defense personnel to execute essential tasks.

moral-ethical
Aligning individual and professional values so evolving values, beliefs, and behaviors are consistent with the ethical norms of the Army Profession.

physical component
Traditional aspects of physical fitness and holistic health and fitness, with an approach that considers the mental and medical contributions to physical performance.

social component
Elements that allow an Army professional to serve the Nation honorably.

Soldier and Army Civilian life cycle
The course of developmental changes through which a Soldier or Army Civilian travels throughout the entire career.

Section III
Special Abbreviations and Terms
This section contains no entries.

Endnotes

[1] Friedl, K., Deuster, P. A., O'Connor, et al. (2007). Human Performance Optimization: An Evolving Charge to the Department of Defense.
[2] United States Army, United States Marine Corps, and the United States Special Operations Command, "Strategic Landpower: Winning the Clash of Wills." http://www.arcic.army.mil/app_Documents/Strategic-Landpower-White-Paper-28OCT2013.pdf.
[3] Army Posture Statement, March 25, 2014, p. 2.
[4] Army Vision—Force 2025 White Paper, 23 January 2014.
[5] Barbara A. Bicksler and Lisa G. Nolan, "Recruiting an All-Volunteer Force: The Need for Sustained Investment in Recruiting Resources—An Update," *Strategic Analysis, Inc.* (December 2009).
[6] For example, officials in New York City revealed that 80% of high school graduates need remedial classes before entering the city's community college system. See "Officials: Most NYC High School Grads Need Remedial Help Before Entering CUNY Community Colleges," (March 2013), <http://newyork.cbslocal.com/2013/03/07/officials-most-nyc-high-school-grads-need-remedial-help-before-entering-cuny-community-colleges/> (11 June 2013).
[7] C. L. Ogden, M. D. Carroll, L. R. Cutrin, M. A. McDowell, C. J. Tabak, & K. M. Flegal, "Prevalence of Overweight and Obesity in the United States, 1999-2004." *Journal of American Medical Association*, 2006, 295, 1549-1555.
[8] See, for example, Peter Gray, "Why Is Narcissism Increasing Among Young Americans?" *Psychology Today*, January 16, 2014, http://www.psychologytoday.com/blog/freedom-learn/201401/why-is-narcissism-increasing-among-young-americans.
[9] Gen. Ramond T. Odierno, CSA remarks at AUSA Institute of Land Warfare Breakfast, Jan. 25, 2012, http://www.army.mil/article/72513/Jan__25__2012____CSA_remarks_at_AUSA_Institute_of_Land_Warfare_Breakfast/.
[10] The Army Human Dimension Council, a 3-star advisory group charted by the Secretary of the Army, approved these outcomes on 28 Feb 2014.
[11] Optimizing the holistic health of Civilians will be in compliance with existing law and policy.
[12] The Human Dimension Integration Framework was developed by subject matter experts during the Unified Quest Human Dimension Workshop, 17-20 April 2012, at Fort Bragg, NC.
[13] Specific human dimension internal stakeholders include, but are not limited to, the following organizations: The Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA M&RA), the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA ALT), Army G-1, Army G-3/5/7, Army G-8, the Office of the Surgeon General, Army Research Institute, the United States Military Academy, the U.S. Army Reserve, the U.S. National Guard, multiple organizations within U.S. Army Training and Doctrine Command, Army Medical Department Center and School, U.S. Army Medical Research and Materiel Command, Army Research Lab, Army Research Office, and the Natick Soldier Research, Development, and Engineering Center. External stakeholders include the U.S. public, the U.S. Department of Education, the U.S. Department of State, U.S. Department of Veterans Affairs, the National Security Council, and the U.S. Department of Health and Human Services.
[14] For more information on current Army talent management efforts, see the U.S. Army Talent Management web site at http://talent.army.mil/.
[15] E. N. Edens, L. A. Riviere, C. W. Hoge, & P. D. Bliese (2010). To stay or not to stay? Family-friendly unit climate and career intentions. In P. T. Bartone, R. H. Pastel, & M. A. Vaitkus (eds.). *The 71F Advantage: Applying Army research psychology for health and performance gains* (395-410). Washington, D.C.: National Defense University Press.
[16] "Learning Sciences is an interdisciplinary field that draws on multiple theoretical perspectives and research paradigms with the goal of advancing knowledge and application of knowledge about human learning and development." Source: https://edpsych.education.wisc.edu/academics/learning-sciences-area.
[17] Flynn, James R., *Are We Really Getting Smarter*, The Wall Street Journal (Online), September 21, 2012, 9:10PM U.S. Eastern Time; accessed on 19November 12, at: http://online.wsj.com/article/SB10000872396390444032404578006612858486012.html.
[18] See, for example, Loten, Angus, *Younger Employees Lack Basic Skills*, Inc. (Online), accessed on 19NOV12, at: http://www.inc.com/news/articles/200610/workforce.html; Musick, Mar, R., MG (Ret) USAF, Scott, Randolph M., BG (Ret) USAF, and Winkelman, Deb, *Omaha Youth: Ready, Willing but Unable to Serve*, Mission: Readiness, 11 October 2012, accessed and retrieved on 21November 12, at: http://www.missionreadiness.org/2012/new-report-most-young-adults-in-omaha-and-statewide-lack-basic-skills-and-qualifications-to-serve-in-military/; U.S. Army Accessions Command (2009). *Strong Students, Strong Futures, Strong Nations, A U.S. Army Whitepaper*, pp. 12-13. Washington, DC; and Texas Higher Education Coordinating Board, *Building Bridges to Success: An Update on the Action Plan to Transition Adult Basic Education Students Into Postsecondary Education and Training*, Austin, TX, 31JAN2012; retrieved on 20NOV12 from: http://www.thecb.state.tx.us/files//dmfile/ABERider29ReportJanuary2012.pdf. Page 2 of *Building Bridges to Success* provides the definition of "basic skills" used here; page 6 projects a more than 100% increase in Texans qualifying for adult basic skills education services between 2010 and 2040.
[19] For a more detailed description of the Continuous Adaptive Learning Model, see TRADOC Pamphlet 525-8-2, C1, The U.S. Army Learning Concept for 2015, Chapter 3.
[20] Card, Stuart K., Thomas P. Moran, and Allen Newell. "The Psychology of Human Computer Interaction Hillsdale." *NJ: LEA* (1983).
[21] E. D. Pulakos, S. Arad, M. A. Donovan, & K. E. Plamondon, "Adaptability in the workplace: Development of a taxonomy of adaptive performance," *Journal of Applied Psychology*, 2000, 85, 612-624,",and Tanja C. Roy, Barbara A. Springer, Vancil McNulty, Nikki L. Butler, , "Physical Fitness," *Military Medicine*, August 2010, 175, 14-20. Also see Paul T. Bartone, Dennis R. Kelly, and Michael D. Matthews, "Psychological Hardiness Predicts Adaptability in Military Leaders: A Prospective Study," *International Journal of Selection and Assessment*, June 2013, 21, 200-210.
[22] Kelly Kotch, "Human Performance Optimization: Maximizing the Capability of Our Warfighters," in *Force Health Protection and Readiness*, Volume 5, Issue 3, 2010, pp. 9-10. Defined as "the process of applying knowledge, skills and emerging technologies to improve and preserve the capabilities of DoD personnel to execute essential tasks." human performance optimization's goal is to optimize the performance of warriors in all conditions and is designed to prepare warfighters for future conflict in the 21st Century.
[23] This may require changes in U.S. law and the application of both Federal Workers Compensation and acceptance of long term care liability for Army Civilians and some Reserve Component Soldiers.
[24] M. Kaspersen, S. B. Matthiesen, & K. G. Gotestam, "Social network as a moderator in the relation between trauma exposure and trauma reaction: a survey among UN soldiers and relief workers." *Scandinavian Journal of Psychology*, 2003, 44, 415-423.
[25] For more information on the five dimensions of strength, see the Comprehensive Soldier & Family Fitness web site at: http://csf2.army.mil/fivedimensions.html.
[26] ADP 1 *The Army* chapter 2 and ADRP 1 *The Army Profession*.

[27] Army Leader Development Strategy 2013, http://usacac.army.mil/cac2/CAL/repository/ALDS5June%202013Record.pdf.
[28] Civilian Workforce Transformation, http://www.army.mil/standto/archive_2014-04-17/
[29] The ASA (MR&A) defines "competence" of Army Civilian Corps members with these three terms, which differs from the ADRP 1 definition of "competence."
[30] See TRADOC Pam 71-20-3, pg. 18 for enhanced RC information.
[31] Human Dimension Initial Capabilities Document (ICD), 12 June 2012
[32] Kelly Kotch, Human Performance Optimization: Maximizing the Capability of Our Warfighters. *Force Health Protection and Readiness* (online edition). http://fhpr.osd.mil/fhp_online/hpo.jsp.
[33] This idea of establishing a baseline for cognition applies equally for physical and social component development.
[34] Similar efforts could be implemented for applicants of government Civilian positions.
[35] The executive summary of *Strong Students, Strong Futures, Strong Nations, A U.S. Army Whitepaper*makes two points. First, it states that in the next decade, "the United States will face a significant workforce shortfall and both the Civilian and military sectors may not have the skilled labor required to meet the demands of a knowledge-based economy." The second point is: "While the current state of our education system is sobering, there is abundant opportunity to improve student outcomes, increase the chances for all our young people to grow into healthy and productive citizens and help them achieve post-secondary success in life and work. The U.S. Army is and wants to remain an essential part of the equation."
[36] Sandi, Carmen, and M. Teresa Pinelo-Nava. "Stress and memory: behavioral effects and neurobiological mechanisms." *Neural plasticity* 2007 (2007).
[37] Folkman, Susan, et al. "Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes." *Journal of personality and social psychology* 50.5 (1986): 992.
[38] See FM 6-22.5 *Combat And Operational Stress Control Manual For Leaders and Soldiers*; FM 4-02.51 *Combat and Operational Stress Control, and* U.S. Department of Veterans Affairs. *Fact Sheet: Veterans with Post-Traumatic Stress Disorder (PTSD).* Washington, D.C.: 2006.
[39] Dr. Jonathan Shay, MD, PhD, in an address, "Moral Leadership," given to the Fort Leavenworth CGSC Ethics Symposium, 16 Nov 2010.
[40] FM 6-22.5 *Combat And Operational Stress Control Manual For Leaders And Soldiers*, 2009.
[41] Wilcox, V. L. (1994). "Burnout in Military Personnel, in *Military Psychiatry: Preparing for Peace for War*, Borden Institute, U.S. Army Medical Department Center & School, *Textbook in Military Medicine*, Jones, F. D., et al editors (Washington, DC: U.S. Government Printing Office, 1994, pp 31-49.
[42] Wilcox, V. L. (2000). Burnout in military personnel. *Military Psychiatry: Preparing in Peace for War*, 31-50.
[34] Pulakos and Donovan, *op. cit*.
[44] R. J. Rona, M. Jones, N. T. Fear, L. Hull, M. Hotopf, & S. Wessely, "Alcohol misuse and functional impairment in the UK Armed Forces: a population-based study." *Drug Alcohol Dependence*, 2010, 108, 37-42. See also Paul T. Bartone, Sigurd W. Hystad, Jarle Eid, and John I. Brevik, "Psychological Hardiness and Coping Style as Risk/Resilience Factors for Alcohol Abuse," *Military Medicine*, June 2012, 177, 517-524, and M. W. Vander Weg, R. C. Klesges, & M. DeBon, "Relationship between smokeless tobacco use and body weight in your adult military recruits." *Nicotine Tobacco Research*, 2005, 7, 301-305.
[45] J. Davy, & M. Gobel, "The effects of a self-selected nap opportunity on the psychophysiological, performance and subjective measures during a simulated industrial night shift regimen." *Ergonomics*,2013, http://dx.doi.org/10.1080/00140139.2012.751459.
[46] Francesca Gino, Maurice Schweitzer, Nicole Mead, and Dan Ariely, "Unable to resist temptation: How self-control depletion promotes unethical behavior," *Organizational Behavior and Human Decision Processes*, Vol. 115, 2011, 191-203.
[47] Christopher M. Barnes, John Schaubroeck, Megan Huth, and Sonia Ghumman, "Lack of sleep and unethical behavior," *Organizational Behavior and Human Decision Processes*, Vol. 115, 2011, 169-180.
[48] Bukalo, O., Campanac, E., Hoffman, D. A., & Fields, R. D. (2013). Synaptic plasticity by antidromic firing during hippocampal network oscillations. *Proceedings of the National Academy of Sciences*, *110*(13), 5175-5180. Access site: http://www.pnas.org/content/110/13/5175.long; Lee, S. H., & Dan, Y. (2012). Neuromodulation of brain states. *Neuron*, *76*(1), 209-222.
[49] Girardeau, G., & Zugaro, M. (2011). Hippocampal ripples and memory consolidation. *Current Opinion in Neurobiology*, *21*(3), 452-459.
[50] Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, *191*(1), 36-43; Vago, D. R., & Silbersweig, D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in human neuroscience*, *6*.
[51] Lombardi, D. A., Jin, K., Courtney, T. K., Arlinghaus, A., Folkard, S., Liang, Y., & Perry, M. J. (2013). The effects of rest breaks, work shift start time, and sleep on the onset of severe injury among workers in the People's Republic of China. *Scandinavian journal of work, environment & health*. Epub ahead of print doi: 10.5271/sjweh.3395.
[52] E. D. Pulakos, S. Arad, M. A. Donovan, & K. E. Plamondon, "Adaptability in the workplace: Development of a taxonomy of adaptive performance," *Journal of Applied Psychology*, 2000, 85, 612-624,",and Tanja C. Roy, Barbara A. Springer, Vancil McNulty, Nikki L. Butler, , "Physical Fitness," *Military Medicine*, August 2010, 175, 14-20.
[53] Pulakos and Donovan, o*p. cit*.
[54] Similar requirements may apply to deploying Army Civilians or contractors as well.