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A Case for Human Dimension Training: Decision Science and Its Potential for Improved Soldier Resilience and Decisionmaking at Every Level

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The Institute of Land Warfare
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LAND WARFARE PAPER NO. 85, October 2011

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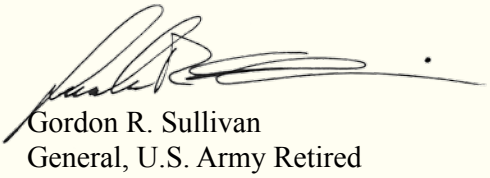
Foreword

Decision science is a field that explores the interconnected influences of emotion, neuroscience and psychology in shaping human judgments. It broadens our understanding of how we assess risks, form alternative paths of action and choose courses to pursue. According to the author, decision science can help tomorrow's Soldiers make better-informed and more self-aware and effective decisions that can improve their lives, the lives of their families and the lives of Soldiers under their leadership/command. In his view, the Army can and should turn to decision scientists to help address these issues and others, as part of an increased focus on training within the human dimension of warfare.

Chosen as the winner of the 2011 AUSA/Army Capabilities Integration Center (ARCIC) writing contest, this paper addresses the theme of the contest ("Capabilities Needed for the Army Future Force, 2025 and Beyond") with an examination of how decision science, as it continues to emerge in some of the finest academic institutions throughout the country, can help the Army achieve a significantly more nuanced and comprehensive understanding of the decisions made by Soldiers, both as individuals and as leaders/decisionmakers at every level of warfare, tactical through strategic. The Soldier as teammate, team leader, decisionmaker, member of a household and individual can benefit from current and future decision science research, which has the potential to unlock the mysteries of why we act and decide in certain ways. It can start a positive chain reaction of better-informed decisions for the Soldier at home and on the battlefield. The author argues that creating a cadre of "decision engineers" has the potential to bridge existing gaps between science and military application and to push decision science further, by looking for continuous applications within the domain of the Soldier as individual and as leader/decisionmaker. The basic result of this research—greater emotional self-awareness for Soldiers—can come about through the growth, understanding and application of decision science. This detailed emotional self-awareness, followed by emotional resilience training, can improve Soldier decisionmaking at home and on the battlefield.

Finally, the author provides recommendations for setting the conditions through which the Army might improve human dimension training, via the examination and exploitation of decision science. He examines the need for destigmatization of emotion testing and resilience training, collaboration with great academic and government institutions, the development of a unifying theory for this research and funding to push the science to support not only the Army but all of the Department of Defense in more productive ways.



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3 October 2011

A Case for Human Dimension Training: Decision Science and Its Potential for Improved Soldier Resilience and Decisionmaking at Every Level

The essence of ultimate decision remains impenetrable to the observer—often, indeed, to the decider himself.

John F. Kennedy[1]

Introduction

After ten years of war and a counterinsurgency (COIN) fight under the banner of "persistent conflict," the United States Army has turned to science for answers to some of its most pressing questions about caring for Soldiers. Military life can amplify everyday emotions and their impact, as seen in suicide and divorce rates, which have climbed over the past five years.[2] This has created the need for the Army to have an emotional resilience system for Soldiers in place from the start of their military service, to be maintained throughout their careers. Senior leaders across the Army appreciated this need to focus on the Soldier through a different lens, with the creation of the Army Human Dimension (HD) Concept and with the formation of Comprehensive Soldier Fitness (CSF) to address growing concerns about the effects of stress on Soldier resilience.

In 2006 General William S. Wallace, commanding general of U.S. Army Training and Doctrine Command (TRADOC), directed development of the HD concept, which provides direction and focus for research and action. According to the "U.S. Army Concept for the Human Dimension in Full Spectrum Operations, 2015–2024" (TRADOC Pamphlet 525-3-7), the human dimension encompasses three components—moral, cognitive and physical—of Soldier, leader and organizational development and performance.[3] General George W. Casey, Jr., Chief of Staff, Army (CSA) from April 2007 to April 2011, also recognized this need and discussed it in his writing on the subject in *American Psychologist*.[4] In his article he describes the four components of Comprehensive Soldier Fitness. Three of the components are online self-assessment, online self-help and training of master resilience trainers. The fourth introduces emotional and psychological elements as a part of mandatory resilience training at every Army leader development school.

Basic research in affective, or emotion, science has shown that emotional resilience training can provide compound benefits for the individual and, at the same time, can improve the overall quality of military units' decisionmaking.[5] But leaders in the field of emotion are just scratching the surface of an emerging science—decision science—that can help the Army achieve a significantly more nuanced and comprehensive understanding of the decisions made by Soldiers, both as individuals and as leaders/decisionmakers at every level of warfare, tactical through strategic. Decision science is a field that explores the interconnected influences of emotion, neuroscience and psychology in shaping human judgments.

It broadens our understanding of how we assess risks, form alternative paths of action and choose courses to pursue.[6] The thread that weaves through both HD and CSF is emotion, but it is decision science that can unlock their potential for improving the lives of Soldiers and the individual and leader decisions they make every day. If we ask the right questions of decision scientists, we can—through destigmatization, collaboration with great institutions and the development of a unifying theory for this research—push the science to support not only the Army but all of the Department of Defense (DoD) in more productive ways.

The Soldier as teammate, team leader, decisionmaker, family member and individual can benefit from current and future decision science research, which has the potential to unlock the mysteries of why we act and decide in certain ways. The basic result of this research—greater self-awareness—can come about through personnel testing at decision science labs throughout the country. Establishing a detailed self-awareness baseline, followed by emotion resilience training, can start a positive chain reaction of better-informed decisions for the Soldier at home, on the battlefield, within the highest levels of the Department of Defense and in the quiet places within each of us. This paper will make the case for improving and expanding Human Dimension training, delivered through CSF and other human dimension efforts, by exploring this emerging field. It will point to opportunities for the Army to shape the direction of this science to ease post-deployment family reintegration and improve overall leader decisions at every level. Most important, it will help us to win in combat and save American lives.

Background

Decision science is a growing field that can help Soldiers to better understand how the emotions resulting from prolonged deployments and combat stress shape their perceptions of risk, their choices in major economic decisions and even their interactions within personal, professional and command relationships. Soldiers' increased understanding of this emerging knowledge base can help them as leaders/decisionmakers to recognize environmental or emotional stimuli, such as stress from combat or simply family dislocation. These stimuli may lead them to certain decisions or place them in situations that create the opportunities for predictable cognitive[7] biases and suboptimal choices. Decision science draws on psychology and economics methodologies along with emerging technologies in neuroscience to study how people make judgments and choices.[8] Traditionally, formal models theorizing rigorously rational, utility-maximizing actors have been used to explain the decisionmaking process and predict individual behavior; yet individuals continue to make decisions that are irrational but in a predictable way. Some of the questions addressed by decision scientists include:

- How do feelings influence thoughts in the brain?
- Can one willfully change one's state of mind while engaged in crisis decisionmaking?
- Are feelings necessarily irrational influences?
- Are decision mistakes and biases predictable and preventable?[9]

By answering these questions and others as part of an increased focus on the human dimension of warfare, decision scientists will help the Army move beyond basic emotion or affective science into a more comprehensive examination of this field of study. Decision

science can help tomorrow's Soldiers make better informed and more self-aware and effective decisions that can improve their lives, the lives of their families and the lives of Soldiers under their leadership/command.

The Soldier as Individual

Emotions are powerful, capable of shaping perceptions and decisions in ways often imperceptible to the individual. The study of emotions , as it continues to emerge within labs throughout the country, has the potential to assist Soldiers in understanding how and why they think the way they do. Using this emerging field to shape training and leader development holds the promise of increasing Soldiers' resilience, empowering them to better deal with the impact of multiple deployments on themselves and their families. The psychology of emotions is one of the key elements of decision science which, if focused on increasing a Soldier's understanding of self, might help to spare families the impact of self-destructive behaviors resulting from the challenges of military life in today's environment—and possibly help reduce suicidal thoughts as well.

This science has shown, for example, that incidental fear and anger exert opposite effects on risk perception, with fear increasing the perception of risk and anger decreasing it. These opposing patterns appear in risk-taking behavior as well as in cognitive and biological processes.[10] Other laboratory work has led to findings related to the Monoamine Oxidase A (MAOA) gene, nicknamed the ''warrior gene'' because it has been linked to aggression in observational and survey-based studies. While MAOA is less associated with the occurrence of aggression in a low-provocation condition, it significantly predicts such behavior in a condition of high provocation. However, no controlled experimental studies have tested whether the warrior gene actually drives the behavioral manifestations of these tendencies.[11] This is another area of research in emotions as part of decision science that can support the Soldier as an individual.

Can Soldiers' knowledge of their emotions allow them to get ahead of this cycle and elicit self-control mechanisms or, at a minimum, help them understand why they are reacting the way they are? The continued development of focused experimentation in decision science labs throughout the country may produce that answer. This lab work could result in Soldiers who understand who they are and how their emotions can manifest, potentially allowing them to manage the outcome of that influence.

The Soldier as Leader/Decisionmaker

Soldiers at every level become leaders who must make decisions. Leaders are expected to analyze choices clearly, choose among alternatives correctly and implement decisions successfully. And the more senior the leadership position, the higher the stakes involved in a leader's decisions. Decision science experimentation can advance Soldiers' understanding of how emotions might affect decisions and can lead to other military applications at every level of warfare.

Decisionmakers at the tactical level might consider research that can determine a Soldier's personal physiological signature. This signature (called affective perception) indicates one's ability to accurately read the emotional state of another human being. Researchers have recently conducted experiments to determine whether it is possible to accurately place individuals along a spectrum of affective perception—thereby potentially identifying those with

high levels of empathy. The findings suggest that highly empathic people tend to demonstrate some specific physiological responses, including high heart-rate variability, that point to a more general physiological quality—relatively high vagal tone. Vagal tone is the level of activity in our parasympathetic nervous system.[12] Those who are less able to gauge correctly the emotional state of another, or have low affective perception, seem to demonstrate lower vagal tone. Viewed at the tactical level, this finding might enlighten a battalion commander trying to determine which of his lieutenants to send into a key leader engagement or negotiation with a local tribal chieftain.[13]

At the operational/strategic level there are other areas within decision science that can assist the Soldier as a leader in making better decisions. Accountability examines how authority relationships shape judgment and choice outcomes. Decision scientists have developed new models that predict when accountability will improve judgment, when it will have no effect on judgment and when it will make matters worse.[14] Researchers can measure two other key elements of one's emotions: sunk-cost bias and resistance to framing. Sunk-cost bias relates to the ability of the decisionmaker to ignore past investments when making a decision and instead focus only on future costs and benefits.[15] Resistance to framing measures the ability of the decisionmaker to ignore irrelevant differences in how information is presented when evaluating options (for example, outcomes presented as a 10 percent loss versus a 90 percent gain).[16] Finally, there are two strategies that people use to regulate their emotions—*reappraisal* and *suppression*. Reappraisal refers to changing one's thinking about a situation to change the emotion one is feeling; suppression refers to inhibiting the expression of emotion.[17] People may use either of these strategies, both of them or none. Researchers are studying how the use of these strategies relates to effective leadership. In the end, these are strategies that can be learned, selected and employed by Soldiers.[18]

These examples reveal some of the laboratory findings that can provide Soldiers as leaders/decisionmakers with increased self-awareness of their innate skills or emotional reactions to events, situations or other stimuli that can influence decisions. One of the conditions of modern protracted conflict is that leaders at every level are making critical decisions. In an environment of COIN or stability operations, a split-second decision by a corporal under stress can have significant and profound consequences for the whole of U.S. interests in a given theater. Thus, the U.S. military needs to understand more clearly what influences "decisions in the moment" in order to achieve better outcomes in the field as well as better decisions at the highest levels of the Army and DoD.

Decision Engineering – Bridging the Gap between Science and Military Application

Key findings about emotions and decisionmaking are emerging from laboratory research across the country and may have significant implications for Soldiers as individuals and as leaders/decisionmakers. However, there is not yet a detailed system for translating the findings from science into recommendations for improving Soldier self-awareness or for showing leaders how to approach decisions or shape the decisionmaking organizations for which they are responsible. Bridging the gap between decision science and military application will require a new field—decision engineering. Decision engineers will develop ways in which insights from lab findings might be translated into programs and policies for training and leader development to improve battlefield effects within a COIN environment—one that focuses on winning hearts and minds through various non-kinetic efforts, rather than kinetic

ones. Decision engineers will operate in the space between scientific experimentation and real-world application. Also, through a balanced mixture of creativity and the experience gained from their own decisionmaking settings, they will propose ways in which specific findings emerging from laboratory research might be translated into testable proposals for improving the evaluation of information and the workings of decisionmaking organizations.[19] Decision engineers will work in the opposite direction as well, understanding the needs and anticipating the questions of Soldiers and commanders in the field. Decision engineers will identify these "requirements" for decision science researchers, who can then develop lab experiments to determine findings that might serve the needs of the Soldier as individuals and as leaders/decisionmakers.

As discussed, what is known today about emotions and decisionmaking—including fear versus anger; emotion recognition; resistance to framing; and sunk-cost bias—can help Soldiers improve their understanding of self and can help them as leaders/decisionmakers to look at key decisions from new perspectives. But imagine knowing more. Imagine knowing, through lab testing and research, how specific combat events play out in a Soldier's mind or the emotional resilience of a family receiving its Soldier back into the family unit. Imagine understanding how particular ethnic groups react to stimuli such as a leader's actions, words or gestures during key leader engagements or as part of a *shura*.[20] Can predeployment cultural awareness training be improved as a result of these new insights? Decision engineering has the potential to bridge the gap between science and military application and to push decision science further, by looking for continuous applications within the domain of the Soldier as individual and as leader/decisionmaker.

The Way Ahead

Destigmatize. Destigmatization must occur on two fronts. First, as an Army, we must overcome the cultural aversion to "soft science" to help solve our problems. Second, leaders must destigmatize the practice of Soldier emotion testing and recognition, as well as resilience training.

Admiral Michael G. Mullen, Chairman of the Joint Chiefs of Staff from October 2007 through September 2011, said it best:

> We must work to end the stigma that prevents our servicemembers, veterans and their families from seeking help early and simplify the number and complexity of programs we currently offer to help. This is a difficult, vexing and complex problem that only leadership can reverse.[21]

The reversal has already begun with the creation of Comprehensive Soldier Fitness. It must now continue throughout the chain of command. Leaders at every level must embrace the concept of Soldier self-awareness and emotion recognition—important links between Soldiers and emotions—for this effort to truly be effective. Commanders must view this not as just another training requirement but rather as a method to save the lives of Soldiers through the reduction of self-destructive thoughts and behaviors. It will also provide the conditions for Soldiers as leaders to make better, more self-aware decisions with fuller understanding of how emotions might impact those decisions. Insights from these key elements of decision science continue to emerge, and Army leaders must capitalize on this science for the health, welfare and combat readiness of their units.

Create. The Army needs to create a unifying theory or set of theories to focus and integrate the efforts of all the ongoing and future research in the domain of decision science. Current work in and around this "space" includes efforts not only at academic institutions in support of the Human Dimension work of TRADOC's Army Capabilities Integration Center (ARCIC) but also at such Army agencies as the Center for the Army Professional Ethic (CAPE) and the Center for Army Leadership (CAL) and with Comprehensive Soldier Fitness.[22] This unifying theory is necessary to synergize the work at these centers and agencies, to include resolving existing issues of taxonomy.[23] But the theory must also have clear objectives and an achievable end state that provides for synchronization and integration of the potential capabilities. Decision engineers can operate effectively in this area, working with leading academics, as well as commanders, to develop a theory or set of theories to shape and direct the efficient and effective development of decision science.

Collaborate. Many academic institutions and government organizations are doing terrific work in the area of emotion research and decision science. The Department of Behavioral Sciences and Leadership at the United States Military Academy (USMA) is heading up two specific CSF-funded projects—a longitudinal research project examining post-traumatic growth in Soldiers exposed to combat and a series of physiological studies examining objective measures of resilience. CSF underwrites other research projects headed by the Walter Reed Army Institute of Research, the University of Chicago and several other leading research institutions.[24]

But the Army needs to create an even greater collaborative research network to increase overall decision science research capacity, thus allowing it to arrive more quickly at the important nexus required between this emerging science and the critical needs of Soldiers today. Other institutions with increased research capacity in this domain include Carnegie Mellon University; the University of North Carolina, Chapel Hill; Duke University; the University of Pennsylvania; and Harvard's Decision Science Laboratory. The Harvard Decision Science Lab, opened in 2009, is one of the largest labs in the country and provides participants the opportunity for self-assessment and to learn more about their own biases, attitudes toward risk, ability to regulate emotions and other key personal insights that can sharpen decisionmaking. This collaborative research network can assist the Army in moving forward more quickly with the insights necessary to help Soldiers as individuals and as leaders/decisionmakers.

Fund. Research collaboration with universities on this scale will require funding. It is understandable that Congress, with tough budget decisions ahead, will choose programs that have proven results rather than more emerging science and technology efforts. The Office of the Chief of Staff, Army, with the support of DoD and Congress, allocated $125 million to CSF,[25] but this endeavor may require more funding to fully energize and unlock the potential of the greatest decision science institutions in the country to focus on the Army's challenges in this domain. The Army should also seek funding through other means, such as public-private ventures that can create value not only for the military but for the civilian sector as well. Overall, this kind of investment has the potential to pay great dividends for the future of Soldiers and the Army. In the *National Military Strategy*, Admiral Mullen stressed the need for a joint force that is "flexible, agile and adaptive [and] emphasizes people as much as platforms."[26] The health of people and the criticality of their decisions, as part of the human dimension of our current wartime challenges, should lead the Army

to ask Congress to support investment in decision science as a way to find solutions for the Army and DoD. Funding this collaborative research network will move the Army forward in this endeavor.

Establish. Finally, the Army must establish a Human Dimension Center of Excellence, composed of decision engineers with an advisory panel of leading psychologists, academics and decision scientists throughout the country. This center will help develop the aforementioned unifying theories and track academic progress at all institutions within the Army's collaborative network. It will also work closely with commanders to educate them on the possibilities for satisfying their unique human dimension challenges within the COIN environment, through the employment of decision science. The center will also educate leaders and support the destigmatization of emotion testing and resilience training throughout the Army. It might also establish professor and student exchanges with USMA and other decision science labs to create more engagement, thinking and education in this domain.

Conclusion

Given budget limitations, the time is right for the Army to increase its focus on a more cost-effective approach to meeting current and future training challenges in the human dimension of warfighting. As General Raymond T. Odierno, the 38th Chief of Staff, Army, stated at his swearing-in ceremony on 7 September 2011, "the strength of our Army is our Soldiers."[27] The Army must maximize its investment where its strength lies, by increasing Soldiers' cognitive development with contributions from decision science that can enhance Soldier behavior and overall decisionmaking performance. The warfighter as teammate, team leader, decisionmaker, member of a household and individual can benefit from new decision science research that has the potential to unlock the mysteries of why we act and decide in certain ways. Through the growth, understanding and application of decision science focused on solving current and future training challenges within the human dimension of warfighting, the Army can improve the lives of Soldiers at home, increase their effectiveness on the battlefield and create better leaders/decisionmakers at the highest levels of the Army and throughout the Department of Defense.

Endnotes

[1] John F. Kennedy, Foreword, in Theodore C. Sorensen, *Decision-Making in the White House: The Olive Branch or the Arrows* (New York: Columbia University Press, 1963), p. xxix.

[2] Data are from two separate sources: CBS News, "Army Suicide Rate Highest Ever Last Year," 29 July 2010, http://www.cbsnews.com/stories/2010/07/29/national/main6725690.shtml; and Amy Bushatz, "Troop Divorce Rates Level in 2010," www.military.com, 18 November 2010, http://www.military.com/news/article/troop-divorce-rates-level-in-2010.html.

[3] U.S. Army Training and Doctrine Command, TRADOC Pamphlet 525-3-7, *U.S. Army Concept for the Human Dimension in Full Spectrum Operations, 2015–2024*, 11 June 2008, p. 1, http://www-tradoc.army.mil/tpubs/pams/p525-3-7.pdf.

[4] George W. Casey, Jr., General, Chief of Staff, Army, "Comprehensive Soldier Fitness: A Vision for Psychological Resilience in the U.S. Army," *American Psychologist*, vol. 66, no. 1 (2011): pp. 1–3.

[5] Sara B. Algoe and Barbara L. Fredrickson, "Emotional Fitness and the Movement of Affective Science from Lab to Field," *American Psychologist*, vol. 66, no. 1 (2011): p. 35.

[6] The subject of this article is the result of the superb cooperation from and collaboration with Dr. Jennifer Lerner, Professor of Public Policy and Management at the Harvard Kennedy School of Government and Faculty Director of the Harvard Decision Science Lab (HDSL), and the HDSL Executive Director, Mr. Mark Edington.

[7] Related to the mental processes of perception, memory, judgment and reasoning, as contrasted with emotional processes, as defined in "cognitive," Dictionary.com, http://dictionary.reference.com/browse/cognitive.

[8] Jennifer S. Lerner, "What Is Decision Science?" Harvard Decision Science Lab website, http://decisionlab.harvard.edu/what-decision-science.

[9] *Ibid*.

[10] Jennifer S. Lerner et al., "Effects of Fear and Anger on Perceived Risks of Terrorism," *American Psychological Society*, vol. 14, no. 2 (March 2003): p. 5.

[11] Rose McDermott et al., "Monoamine oxidase A gene (MAOA) predicts behavioral aggression following provocation," *Proceedings of the National Academy of Sciences*, vol. 106, no. 7 (February 2009): p.1.

[12] Pierre Rainville et al., "Basic Emotions are Associated with Distinct Patterns of Cardiorespiratory Activity," *International Journal of Psychophysiology*, vol. 61 (2006): p. 17.

[13] This application is the result of discussions with Mark Edington, Executive Director of HDSL, and during his study group, "Leadership Decision Making: Building Approaches from Laboratory Insights," at Harvard's Kennedy School of Government.

[14] Harvard Decision Science Lab website, http://decisionlab.harvard.edu/what-decision-science/profiles.

[15] Dr. Jennifer Lerner introduced these concepts to Harvard National Security Fellows during their executive sessions in August 2010. This topic can also be found in Wändi Bruine de Bruin et al., "Individual Differences in Adult Decision-Making Competence (A-DMC)," *Journal of Personality and Social Psychology*, vol. 92, no. 5 (2007): pp. 938–956.

[16] *Ibid*.

[17] James J. Gross and Oliver P. John, "Individual Differences in Two Emotion Regulation Processes: Implications for Affect, Relationships, and Well-being," *Journal of Personality and Social Psychology*, vol. 85, no. 2 (2003): pp. 348–362.

[18] This idea is the result of consultation with Christopher Oveis, PhD, Postdoctoral Fellow and Adjunct Lecturer in Public Policy, John F. Kennedy School of Government and Harvard Decision Science Laboratory, Harvard University.

[19] This paragraph summarizes discussions with Mark Edington, Executive Director of HDSL, March–May 2011.

[20] *Shura* (Arabic), in this context, is a consultative council or assembly. See Dictionary.com, http://dictionary.reference.com/browse/shura.

[21] Michael G. Mullen, Admiral, Chairman, Joint Chiefs of Staff, *National Military Strategy 2011: Redefining America's Military Leadership*, February 2011, p. 17, http://www.jcs.mil/content/files/2011-02/020811084800_2011_NMS_-_08_FEB_2011.pdf.

[22] This idea of creating a unifying theory was the result of collaboration and discussion with the Comprehensive Soldier Fitness Office, Headquarters, Department of the Army, Deputy Chief of Staff, G-3/5/7.

[23] The Human Dimension Concept has three components: moral, cognitive and physical. Comprehensive Soldier Fitness has five "dimensions of strength": physical, emotional, social, family and spiritual. A possible linkage of HD components and CSF dimensions of strength might be: moral (social, spiritual), cognitive (family, spiritual, emotional), physical (physical, emotional, spiritual); note that "spiritual" is part of all three.

[24] See endnote 22.

[25] Casey, "Comprehensive Soldier Fitness," p. 3.

[26] Mullen, *National Military Strategy*, p. 21.

[27] General Raymond T. Odierno, swearing-in ceremony, Joint Base Myer-Henderson Hall, Virginia, 7 September 2011, http://armylive.dodlive.mil/index.php/2011/09/initial-thoughts-from-general-ray-odierno-38th-chief-of-staff-of-the-army/.

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