Dereliction of Operational Expertise: How Self-Efficacy Shapes Decisionmaking

A Monograph

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2019

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
23-05-2019	SAMS Monograph	June 2018-May2019

4. TITLE AND SUBTITLE
Dereliction of Operational Expertise: How Self-Efficacy Shapes Decisionmaking

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
MAJ Aaron J. Tucker, USA

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
School of Advanced Military Studies (SAMS)
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Advanced Operational Arts Studies Fellowship, Advanced Military Studies Program.

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
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15. SUBJECT TERMS
Self-Efficacy, Decisionmaking, Adult Education, Dunning-Kruger Effect, Impostor Phenomenon, Wargaming

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Aaron J. Tucker
(U)	(U)	(U)	(U)	61	19b. TELEPHONE NUMBER *(Include area code)*

Monograph Approval Page

Name of Candidate: MAJ Aaron J. Tucker

Monograph Title: Dereliction of Operational Expertise: How Self-Efficacy Shapes Decisionmaking

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Abstract

Dereliction of Operational Expertise: How Self-Efficacy Shapes Decisionmaking, by MAJ Aaron J. Tucker, US Army, 61 pages, 10,185 words.

In 1995, LtGen(R) Paul Van Riper pitted bankers against US Marine Corps generals in two contests – a stock exchange simulation and a wargame. The venture capitalists won both exercises, beating standing operational leaders that represented decades of deployment and experience. LtGen(R) Van Riper believed that the money managers success stemmed from resiliency and confidence in ambiguous situations. Learning from this failure, the US Army may be able to increase operational leader effectiveness by fostering self-efficacy – confidence – in relation to observed ability.

A literature review discusses the doctrine and theory behind how commanders discern the environment, learn as adults, and explains how leaders make rapid decisions during execution. Human subjects research replicates the general aspects of the 1995 wargame, now modified for play between instructors from the US Army Command and General Staff College and civilian recreational board-gamers. Information collected explores the validity of LTG(R) Van Riper's claim while simultaneously measuring confidence levels. The discussion describes the impact of confidence on leader cognitive functions when making rapid decisions. Recommendations provide options on utilizing self-efficacy in leader development.

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Acknowledgments

While my name may appear below the title of this monograph, what you are about to read was a group effort. First, to my wife and children that endured multiple trips into Kansas City, tagging along from one game shop to another. You allowed me the freedom to research to build a network of gamers. You served as the common-sense reminder, and, perhaps my wife also deserves the title of editor-in-chief as she has been the clearinghouse for grammar and readability. She is, quite possibly, the only non-SAMS person who will ever read this paper.

Next, special thanks to Dr. Nagel – one of the few SAMS professors to say "yes" to both human subjects research and an obscure, out-of-vogue topic. Why you did not force me to write a historiography of an already well-documented military operation, maybe GEN Patton's actions in the Ardennes, is beyond my years of wisdom. Thank you for supporting a crazy idea that most others believed was doomed to fail by the end of TOA. And, to COL Watson, thank you for your constant check-on-learning. You, too, said yes and let me explore self-efficacy before explaining to me how pretentious the term sounds. Thank you for forcing me to be finished before opening day of the Royals.

And, as much as this monograph hinged on collected game data, I am indebted to Dr. James Sterrett and Mr. Michael Dunn in the DSE. The fictitious war for control of the San Joaquin Valley would never had come to life if it were not for your recommendations, guidance, and humor. You helped spark my nerdy passion for all types of gaming. More importantly, you spoke both game-nerd lexicon and Army jargon and helped finds ways to merge the two together.

Like many a monograph, this research quest began as an MMAS. Special thanks to Dr. Richard McConnell who helped guide me from data, to information, to knowledge. Thank you for letting me pester you for a second year. Finally, a big debt of gratitude is owed to the research participants that shall not be named. You sacrificed personal time for literally no compensation. Thank you to DTAC and Level Up Games – I literally could not have done this without you.

Acronyms

ARDP	Army Doctrine Reference Publication
CGSOC	Command and Staff Officer College
DoD	Department of Defense
DTAC	Department of Army Tactics
ELM	Experiential Learning Model
FM	Field Manual
IPI	Identifiable Private Information
LSCO	Large-Scale Combat Operations
MDMP	Military Decision Making Process
NDM	Naturalistic Decisionmaking
NTC	National Training Center
RDSP	Rapid Decisionmaking and Synchronization Process
TRADOC	Training and Doctrine Command
VOPFOR	Virtual Opposing Forces

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Introduction

> It was all coming too fast for COL Always A. Tack. He had steeled himself to accept the fact that he was dead, but what did the National Training Center have to do with that, and who was waiting for him twenty some miles deeper into the desert? He had been a professional officer for most of his adult life, and not a bad one at that. For the most part he had lived a decent and respectable life. Yet, if these were the gates to heaven, and the man standing in front of him was the gatekeeper, it was not exactly what he had been led to expect.
>
> —James R. McDonough, *The Defense of Hill 871*

Imagine how the US Army grew and developed COL Tack from his days as a steely-eyed cadet to supposedly competent decisionmaker. Picture his emotional and cognitive state, knowing that his banishment to the National Training Center occurred because he failed to achieve results. Having such an illustrious resume, the Army assumed COL Tack could make sound decisions. However, commanders require more than just an arbitrary number of training experiences to become well-rounded warfighters. Sans deployments supporting large-scale combat operations (LSCO), the fictitious commander's development was at odds with other competing demands. Like many other leaders in the US Army, exercising operational decisionmaking remained a relatively limited event.

Exacerbated by the doctrinal shift to LSCO, victory mandates that the US Army develop leaders that will succeed in the next unknown conflict. Because of uncertainty, the US Army must research how to develop the decisionmaking ability of operational leaders during execution while managing forces at the edge of chaos.[1] Organizations assume digital exercises and home station training provide the rigor and quantity to form leader abilities. However, when confidence fails to align with ability, the probability of success dwindles. LtGen(R) Paul Van Riper explored a similar concept in 1995. He pitted Wall Street brokers against US Marine Corps generals in two different events – a stock market competition and a wargame. In both instances, the venture

[1] "[T]he edge of chaos – is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence..." M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos* (New York: Simon and Schuster, 1992), 12.

capitalists won. LtGen(R) Van Riper surmised that the civilians "were far more willing to act decisively on the kind of imperfect and contradictory information that is all you ever get in war."[2]

LtGen(R) Van Riper's description of the fog of war is not a new development in warfare. Theorists Carl von Clausewitz and Baron Antoine-Henri Jomini commented on the subject in the early 19th century.[3] However, the experiment identified a possible additional cognitive step in decisionmaking. Even while operating in an uncertain environment, the businessmen persevered through their discomfort and reacted to the emerging situation. These money managers properly translated self-confidence into effective decisionmaking within an unfamiliar domain. Similarly, the US Army can increase the effectiveness of operational leader decisionmaking by fostering self-efficacy in proportion to abilities through the blending of repetitive results-based training and candid feedback.

This researcher explored the role of self-efficacy, commonly referred to as confidence, in operational decisionmaking while conducting LSCO. Commanding generals will rapid decisions in the age of big data. In future combat, leader self-doubt may contribute to mission failure. Doctrine directs commanders to trust their experiences; however, the same writings provide little insight into evaluating professional judgment and the impact of practice and observation of an individual's skills.[4]

In the pursuit of facts supporting self-efficacy concerning judgment and practice, assumptions remain. Human subjects research may dispel some of these assumptions. First, many individuals in the US Army do not believe that operational leaders receive enough repetitions at

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[2] Thomas A. Stewart, "How to Think With Your Gut: How the Geniuses Behind the Osbournes, the Mini, Federal Express, and Starbucks Followed Their Instincts and Reached Success," *Business 2.0* (n.d.), accessed September 21, 2017, http://old.cognitive-edge.com/wp-content/uploads/1998/09/49-Thinking-with-your-Gut-T-Stewart-article-in-Bus-2-2.pdf.

[3] Carl von Clausewitz, *On War* (Princeton, NJ: Princeton University Press, 2008), 63; Antonie-Henri Baron de Jomini, *The Art of War* (Philadelphia: JB Lippincott and Co, 1862), 30.

[4] US Department of the Army, *Field Manual (FM) 6-22, Army Leadership* (Washington, DC: Government Printing Office, 2015), 1–2.

decisionmaking during training. Semi-structured interviews may confirm this widespread assumption. Next, doctrine assumes leaders automatically execute an additional cognitive step in decisionmaking. After mentally selecting a course of action, leaders must possess enough confidence to translate decision into action.[5] The third assumption presumes the US Army does not provide candid feedback during training events. While the practice is not absent in doctrine, it may not be as frank as required to facilitate holistic leader development.[6] When conducted correctly, frank discussions provide a perspective of one's ability and efficacy.

While research advanced the understanding the impact of self-efficacy, limits prevented this work from being universally applied across the force. Due to the number of available generals within an acceptable distance of the primary researcher, research could not reach the required number of experiments to achieve a number of statistical significance. Descriptive statistics provide only a proof of concept. Because of the insufficient pool of flag officers within the Kansas City area, instructors from the US Army Command and General Staff Officers Course (CGSOC) replicated operational leaders.

Four additional sections frame the remainder of the monograph. Section two, the literature review, covers three key aspects of decisionmaking: the environment, natural cognitive processes, and adult learning, while also explaining the psychological theory and role of self-efficacy. Describing the environment as a complex adaptive system serve as a frame to discuss environmental relationships outlined in *Training and Doctrine Command Pamphlet (TRADOC Pam) 525-3-1, Win in a Complex World*. The literature review also explores psychologist Gary Klein's work on Naturalistic Decisionmaking (NDM), investigating how it crystalized into doctrine. Next, the Experiential Learning Model (ELM) developed by psychologist Kurt Lewin serves as the cornerstone theory behind how the US Army develops curriculum. Finally, the

[5] Ibid., 7–19.

[6] US Department of the Army, *Field Manual (FM) 7-0, Train to Win in a Complex World* (Washington, DC: Government Printing Office, 2016), A-5.

review concludes with an introduction to self-efficacy. While the literature review explores the history of operational decisionmaking, section three, methodology, describes the data collection process.

Using a qualitative approach, research may identify relationships between aspects of a subject's ability and perceived self-efficacy. A questionnaire provides baseline data for the game and semi-structured interviews. The game creates an experience against another human adversary. Interviews focus on the cognitive and emotional state of participants. Section four captures and aggregates the data collected while the final section provides discussion and recommendations. Findings from information collected may aid in preventing real commanders from experiencing the same fate of COL Tack.

Literature Review

In purgatory, COL Tack made decisions while balancing three concepts – the environment, cognition, and knowledge. Within each category, theory and doctrine shaped how he perceived the battlespace. Doctrine delivers guiding principles that create a baseline understanding. Units craft training events in meticulously detail with for the purpose of increasing the trainee's knowledge. While frequency is a metric of training plans, quantity does not correlate to quality. Doctrine advocates that an increase in knowledge is the accurate measure of effectiveness. Codified theory gives much less consideration to the emotional and cognitive relations occurring within developing leaders and its impact on results.

Complex Adaptive Systems

At first glance, the world seems chaotic. Individuals continuously react to environmental stimuli yet are never able to accurately predict the day's outcome. However, the world is not as irrational as it feels. Reflection and analysis lead to an understanding that individuals live at the edge of chaos – where the pieces and parts of self-organizing systems remain fluid in time.[7] Enter

[7] Waldrop, *Complexity*, 12.

complexity theory, an idea that centered on the relationships between parts of a system and how these relationships lead the system's behavior as it interacts with the environment.[8] From Bar-Yam's perspective, the world is an interwoven set of complex systems. These systems consist of nodes which continuously interact, resulting in no natural equilibriums. These elements only have a partial understanding of their associated network. History informs nodes; cells recall experiences to inform future actions. Finally, these systems are usually open – allowing simultaneous interaction with a multitude of other structures.[9]

To better describe complexity, the analogy of a large family reunion where four immediate families gather together is a useful thought experiment. Each immediate family illustrates a node in a complex system. Loved ones will interact with one another, exchanging information that may shape each member's future behavior. There is no equality between nodes, although grandparents may garner more respect than children. Knowledge and history inform the conversation between each family member. Also, each person's agency is synonymous with their ability to talk to other, perhaps more distant, family members.

Complexity developed primarily at the Santa Fe Institute in New Mexico during the 1980s. With the proliferation of computation power, some scientists shifted to observing entire systems. Computers allowed researchers the ability to model multiple systems interacting.[10] The interplay between nodes led to the development of nonlinear dynamics – the idea that stimulating one system's node may produce an effect in a different system.[11] Additionally, research on nonlinear dynamics gave way to the notion of complex adaptive systems where adaptation is critical. When a structure's nodes self-organize, each node executes their actions, or inactions,

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[8] Yanner Bar-Yam, *Making Things Work: Solving Complex Problems in a Complex World* (St. Louis: Knowledge Press, 2004), 19, 24.

[9] Paul Cillers, *Complexity and Postmodernism: Understanding Complex Systems* (London: Routledge, 1998), 2–3.

[10] Waldrop, *Complexity*, 53.

[11] Ibid., 64–65.

based on the limited information available about the network. Complex adaptive systems reside between chaos and order.

Terms such as complex adaptive systems and nonlinear dynamics are nondoctrinal. Though the US Army lacks percise language for complexity, the doctine widely acknowledges the theory of complex adaptive systems. In 2014, the US Army published *Win in a Complex World*. Attempting to prevent anchoring the Army against a single foe, the concept explained the possible environment of the next conflict. The title highlights the Army's acknowledgment of complexity. The document outlines an interconnected world filled with uncertainty, describing populations and adversaries as systems of systems.[12] The Army envisions future conflict a increased interaction, adversaries with overmatch, proliferation of weapons of mass destruction, cyberspace operations, and battles within megacities.[13] The characteristics of the future environment mirror the characteristics of complexity. The Army anticipates operating at the edge of chaos, where multiple systems continuously complete and interact. A revised *TRADOC Pamphlet 525-3-1*, aligning the operating concept with Multi-Domain Operations, continues the notion of the future world as a complex adaptive system.[14] It is in this environment where leaders will deliberate, decide, and act.

Experiential Learning

Ambiguity clouds most decisions. While the environment and naturalistic decisionmaking impact problem-solving, the decisionmaker's experiences shape their formulation of options. Psychologist Kurt Lewin developed a model that linked experience and reflection with adult learning. ELM identifies the linkage between cognition and experience. The learner

[12] US Department of the Army, *Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, The US Army Operating Concept: Win in a Complex World* (Washington, DC: Government Printing Office, 2014), 10.

[13] Ibid., 11–12.

[14] US Department of the Army, *Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, The U.S. Army in Multi-Domain Operations 2028* (Washington, DC: Government Printing Office, 2018), 6.

experiences an event and reflects on what happened, creating an opportunity for the learner to generate a creative idea. For Lewin, experience is central to learning because it provides an anchor point for individuals.[15] In the final step of ELM, individuals test their new concepts in another similar experience. ELM also describes learning as a never-ending spiral. Multiple experiences may be required to generate novel ideas.[16] Lewin viewed learning as a lifelong process comprised of work, personal development, and education.

Doctrine echoes these same pillars to lifelong learning. As stated in *Army Regulation (AR) 350-1*, leaders develop skills continuously while operating in the operational, institutional, and self-development domains.[17] Likewise, doctrine mirrors ELM's penchant for concrete experiences. Mentioned over 180 times in the current *FM 6-22, Army Leadership*, experience is a critical factor within the Army's overall strategy for leader development. Learners must make meaning out of training experiences. Soldiers must observe their performance in an event, conduct candid discussions to gain additional perspective, and reflect on their actions.[18] *FM 6-22* assumes that trainees develop relevant abstract concepts that will provide solutions for future problems.[19] Doctrine assumes experience builds confidence, leadership, and competence. Kolb, however, warns that experience alone may not induce reflection or generate new ideas. Learners must accept their experiences. To account for ownership, the US Army works to create challenging situations. Doctrine asserts that difficult experiences will force leaders to develop

[15] David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Upper Saddle River, NJ: Pearson Education Inc, 2015), 26.

[16] Kolb, *Experiential Learning*, 23.

[17] US Department of the Army, *Army Regulation (AR) 350-1, Army Training and Leader Development* (Washington, DC: Government Printing Office, 2017), 2–4.

[18] US Department of the Army, *Field Manual (FM) 6-22, Army Leadership* (Washington, DC: Government Printing Office, 2015), 3–16.

[19] US Department of the Army, *Field Manual (FM) 7-0, Train to Win in a Complex World* (Washington, DC: Government Printing Office, 2014), 1–5.

their abilities, modify behaviors, and think through problems.[20] The learner accepts the outcome of the experience because they made each choice of their own free will.

FM 7-0, Train to Win in a Complex World reinforces doctrine's appeal for rigorous experiences. The Army claims that complex environments serve an integral part during training. Training now requires task evaluations, measuring the volume of complexity within a specific event. Overly-simplistic environments will fail to increase unit proficiencies.[21] For training, the Army defines complex environments as requiring eight replicated operational variables.[22] The drive for realistic training allows future decisionmakers to hone skills in arduous situations. Doctrine still assumes that over time the quantity of training events creates a capable leader. While doctrine links realistic training with an individual's capabilities, US Army guidance only hints at the development of one's efficacy. Training manuals assumes that self-efficacy and capability maturate proportionally.

Naturalistic Decisionmaking

Conceived in Dayton, Ohio, the Naturalistic Decisionmaking Process (NDM) provides a theory that leverages individual expertise when solving problems. Developed in 1989, social scientists met with the US Navy to research why a naval cruiser's captain mistakenly attacked an Iranian commercial airliner.[23] The incident required detailed understanding of decisions made in real time, under stress, and within a complex environment. Findings led to the development of the NDM.[24] Devised by psychologist Gary Klein, the theory postulates that decisionmakers in

[20] US Army, *FM 6-22* (2015)*,* 3–29.

[21] US Army, *FM 7-0*, B-5.

[22] US Department of the Army, *Army Doctrine Reference Publication (ADRP) 7-0, Training Units and Developing Leaders* (Washington, DC: Government Printing Office, 2012), B-6.

[23] Gary A. Klein, "Reflections on Application of Naturalistic Decision Making," *Journal of Occupational Psychology* 88 (2015): 382.

[24] Ibid., 382–383.

execution do not have the time for analytical thinking; they must harness past experiences to identify an adequate solution.[25]

Klein asserts that analytical decisionmaking takes too long. After studying military leaders and firefighters, he discovered that leaders deliberated for less than one minute before making a decision.[26] Decisionmakers leverage knowledge, training, and experience to compress the Military Decision Making Process (MDMP). Multiple academics agree with Klein's hypothesis that as complexity increases and time decreases, decisionmakers rely more on heuristics.[27] Aligned with complexity theory, the NDM assumes that environments are ill-constructed and dynamic with multiple actors operating toward differing goals.

For the US Army, the alignment from academia to doctrine is relatively new. In 2005, 18 years after the USS *Vincennes* investigation, the Army remained beholden to analytical decisionmaking. The 2005 edition of *FM 5-0, Army Planning and Orders Production* identified that during execution an operation might "outrun" the order. Even in execution, omitting steps in the MDMP was unsound. Doctrine described the MDMP as a "proven process that must be modified with slightly different techniques to be effective when time is limited."[28] Entering the 21st century, the US Army deterred use of heuristics and experience in rapid decisionmaking. Not until 2010 did the US Army crystalize the NDM into the Army thinking.[29]

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[25] William Hardy, *Recognition-Primed Decision Making*, White Paper (Fort Leavenworth, 2016), accessed August 7, 2018, http://cgsc.contentdm.oclc.org/cdm/singleitem/collection/p16040coll2/id/23/rec/14. (12).

[26] Gary A. Klein, "Strategies of Decision Making," *Military Review* LXIX, no. 5 (1989): 57–58, accessed August 6, 2018, http://cgsc.contentdm.oclc.org/cdm/ref/collection/p124201coll1/id/504/rec/10.

[27] Hardy, *Recognition-Primed Decision Making*; Rebecca Grossman, Jacqueline M. Spencer, and Eduardo Salas, "Enhancing Naturalistic Decision Making and Accelerating Expertise in the Workplace: Training Strategies That Work," in *Judgement and Decision Making at Work* (New York: Routledge, 2014), 283.

[28] US Department of the Army, *Field Manual (FM) 5-0, Army Planning and Orders Production* (Washington, DC: Government Printing Office, 2005), 3–58.

[29] US Department of the Army, *Field Manual (FM) 5-0, The Operations Process* (Washington, DC: Government Printing Office, 2010), 5-8 - 5-14.

Current doctrine, which remains relatively unchanged in regards to NDM, truncates aspects of the MDMP. Renaming the NDM to the Rapid Decisionmaking and Synchronization Process (RDSP), commanders utilize their intuitive judgements resulting in a directed course of action. Doctrine still advises commanders and staffs to exercise detailed, analytical planning. However, guidance now accounts for time constraints and friction.[30]

Self-Efficacy

While complex systems, adult education, and naturalistic decisionmaking aid operational leaders, something is missing that links these elements together. Self-efficacy – confidence – provides the language that describes how leaders amalgamate understanding into action. Pioneered by Albert Bandura, self-efficacy refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designed types of performances."[31] Primarily shaped by experience, one's efficacy does not refer to actual ability; it relates to how one mentally perceives their skills. For instance, an individual may possess all the required abilities to create a birdhouse; however, if they do not believe that they can coalesce skillsets together, they will not build the house. Research has found that one's level of perceived self-efficacy impacts an individual's performance and motivation in task accomplishment.[32]

An individual's self-efficacy is not inflexible, nor are levels of confidence evenly applied to all skills. Efficacy links confidence with a skill. An individual may have a high degree of efficacy in basketball but a relatively low degree of confidence in playing the piano. The link between perception and ability impacts whether an induvial will attempt a task. Low confidence usually indicates that individuals will not succeed with task completion and will attempt to avoid

[30] US Army, *FM 5-0*, 5-8 - 5-14.

[31] Albert Bandura, *Social Foundations of Thought and Action: A Social Cognitive Theory* (Englewood Cliffs: Prentice-Hall, 1986), 391.

[32] Albert Bandura and Edwin A. Locke, "Negative Self-Efficacy and Goal Effects Revisited," *Journal of Applied Psychology* 88, no. 1 (2003): 87.

the situation.[33] Because self-efficacy is fluid within individuals, Albert Bandura and other psychologists advocate aligning one's ability and efficacy. Misalignment may lead to people restricting their potential or placing themselves in situations beyond their capability.[34]

As individuals proceed through their lives, self-efficacy evolves. Experience provides the most significant opportunity to one's efficacy as it provides immediate feedback. Replicating complex environments provides opportunities for individuals to test their ideas, a similar notion to Lewin's concept of active experimentation.[35] Observation, referred to as vicarious learning, also shapes one's efficacy. Observing others, individuals may identify ease or difficulty in task accomplishment.[36] Verbal persuasion provides another mechanism to affect efficacy by using language to imply the effectiveness of a person's skills.[37] The person giving feedback should provide realistic, accurate feedback that informs the individual.[38] Finally, emotional or psychological arousal may temporarily change self-efficacy, as emotions impact confidence during task-execution.[39]

Previously, self-efficacy held an insignificant position within Army leader development. From 2006 until 2012 doctrine officially defined self-efficacy The concept held three lines that regurgitated data from *The Encyclopedia of Human Behavior*.[40] The force largely ignored the

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[33] Nancy E. Betz, "Contributions of Self-Efficacy Theory to Career Counseling: A Personal Perspective," *The Career Development Quarterly* 52 (2004): 342.

[34] Bandura, *Social Foundations of Thought and Action*, 393–394.

[35] Albert Bandura, "Self-Efficacy: Toward a Unifying Theory of Behavioral Change," *Psychology Review* 84, no. 2 (1977): 196.

[36] Bandura, *Social Foundations of Thought and Action*, 399–400.

[37] Bandura, "Self-Efficacy," 198.

[38] Nazmiye Ülkü Pekkan, "Is It Possible to Improve Self-Efficacy with Coaching?" *International Journal of Eurasia Social Sciences* 9, no. 33 (2018): 2025.

[39] Bandura, "Self-Efficacy," 198.

[40] US Department of the Army, *Field Manual (FM) 6-22, Army Leadership: Competent, Confident, Agile,* (Washington, DC: Government Printing Office, 2006), 7–7, R-3.

concept. In the 2012 edition of *Army Doctrinal Reference Publication (ADRP) 6-22*, the US Army rescinded the term.[41]

Currently, doctrine assumes that experience, coupled with institutional training and self-development, creates expertise. Senior leaders, who are presumably experts, are responsible for developing effective subordinates. However, advancement does not equate to expertise. Measuring one's self-efficacy, especially as leaders advance from tactics to operations, may indicate the effectiveness of leaders in their wartime duties.

Methodology

To determine the average self-efficacy among current operational leaders, a qualitative approach using surveys, games, and interviews provided means for holistic data collection. The theory of self-efficacy provided the intellectual framework for data collection tools. Information from the research integrates into the detailed examination of education, natural decisionmaking, and complexity reflected in the literature review.

The proposed human subjects research utilized qualitative approaches to gather the most comprehensive data within research limitations. The questionnaire served as the baseline for research. It collected pertinent data on the participants combined with the minimum amount of identifiable private information (IPI). The form requested three types of information - identity, experience, and self-efficacy. Identity information requested the minimum required aspects of an individual's IPI to facilitate the research with information provided remaining confidential. The questionnaire acquired information on a participant's experience and self-efficacy, establishing a baseline between attributes per individual. The researcher assigned a research protocol number to each participant, using the number on all collected materials. The primary researcher maintained

[41] US Department of the Army, *Army Doctrinal Reference Publication (ADRP) 6-22, Army Leadership* (Washington, DC: Government Printing Office, 2012), vi.

a securely stored key of research protocol numbers identifying IPI. Following CGSOC policy, the researcher never stored the protocol key with other collected data.[42]

Self-Efficacy Survey

Survey questions relate to the participant's self-efficacy and experience at the operational level of war concerning the mission command and intelligence functions. The questioner also collects data about the gets results leader attribute. Intelligence, mission command, and the gets results attribute serve as three independent variables to measure self-efficacy. Intelligence survey questions correlate to an individual's understanding of the environment and threat as discussed in the complex adaptive systems portion of the literature review. The mission command function relates to NDM. Questions concerning confidence in achieving victory correlated with the gets results leader attribute. The survey collected data for Hypothesis One: Each participating group would score higher levels of self-efficacy in the task in which they perceive the most experience. The questionnaire also provided information on Hypothesis Two: Each participant would score self-efficacy low, as denoted by scores under 50, in unfamiliar tasks. The results of these ideas determine Hypothesis Three: There will be a ten-point minimum difference between group perceived self-efficacy between task categories or independent variables.

After completing the questionnaire, participants competed in a civilian-versus-militarist practicum using a self-created, block, turn-based, wargame designed to replicate the critical elements of the operational level of war. A novel game prevented serious recreational gamers from gaining an advantage from previous gameplay. Data collected from the survey allowed the primary researcher to pair recreational gamers with operational leaders based on levels of perceived self-efficacy and experience. Before the exercise, participants learned the rules and listened to the game scenario. The practicum provided data to determine the result of Hypothesis

[42] See Appendix A, Initial Survey, Created by Author.

Four: Because of training an experience, DTAC instructors would defeat their recreational gamer counterparts by a ratio of five-to-one.

Wargame Practicum

A blind, block turn game replicated a dynamic and uncertain environment. Because wooden blocks identified units on the game board, the block-face containing unit information remained hidden from the opposing player until there was an engagement. Additionally, each player had four blocks with no unit information, replicating the fog-of-war. Until a battle occurred, participants would only see their opponent move colored blocks across the game board. Because of this, there was no need for additional referees to adjudicate the game. A brief intelligence summary described an imperfect situational update. The primary researcher provided participants the same amount of time before the start of the game to analyze game mechanics and the intelligence estimate, allowing each player to determine an initial course of action.[43]

During execution, digital video cameras captured game data for later review by the participants and the researcher. The aggregate win-loss total between recreational gamers and operational leaders was a crucial output for the research. A significant amount of victories by one party over another may aid in determining the overall ability level of current operational leaders.

Due to the game's simplicity, there was no need for trained research assistants to proctor the wargame. Before the event, the primary researcher oriented the players to their environment, ensured consent forms had been signed, and verified player consent. The primary researcher interacted with subjects during the game only to clarify rules and correct rule violations.

After completion of each game, the researcher analyzed video and refined questions to ask during each semi-structured interview. The facilitated discussion focused on retrieving information on how players acted in formulating their decisions. Interviews discussed how players' emotions – such as apprehension, doubt, confidence – may have affected the timing of

[43] See Appendix B, Game Board, Created by Author; See Appendix C, Game Rules, Created by Author.

actions, or inaction, during the game. If the primary researcher identified that the question invoked a high level of distress on a participant, questioning ceased. The researcher conducted interviews with both recreational gamers and operational leaders to determine the impact of self-efficacy on operations. Similar to the actual game data-capture, video devices recorded the semi-structured interviews to maintain fluid conversations with the subjects. Video clips would be shown to participants by the researcher, if necessary, to ensure both parties were discussing the same event. The primary researcher created a summary of each semi-structured interview, reviewing the summary with the participant. Summaries were not used for analysis until approved by the participant.[44]

Because the experiment's purpose was a proof of concept, only six participants from each category – recreational gamer and operational leader – were required. A total of six games may determine an initial pattern between self-efficacy and ability that translates to the probability of operational victory. To protect the rights of participants, the researcher used two consent forms to ensure players remained aware of all information collection. More importantly, the protocol ensured that participants understood why this information was collected. The initial consent form covered participation in the questionnaire and the game. Specifically, the consent form addressed survey questions, the game played blind, the requirement for research conducted after duty hours, and described the reason for the game as "determining the impact of leadership at the operational level."

The reason listed on the initial consent form was deceptive; research explored the effect of self-efficacy about decisionmaking – an aspect of leadership. The primary researcher believed that there was no feasible nondeceptive procedure to collect the same information. If the researcher mentioned self-efficacy at the onset of the study, the terms may have skewed how individuals answered questions regarding confidence. Additionally, it may have led to priming

[44] See Appendix D, Semi-Structured Interview Questions, Created by Author.

participants to act differently during the wargame. In both the deception and the data collection tools, there was no intent to place participants in physical harm, emotional harm, or distress.

To maintain transparency with participants, after each game, the primary researcher explained what the primary purpose of the questionnaire and game were to the participants. The researcher then asked the participants if they wished to continue in the study. The primary researcher immediately destroyed information provided by those who chose to opt out of the study. Those wishing to continue with the study completed the second consent form. After the game there was zero deception. Compared to the game or questionnaire, the semi-structured interviews answered the primary research question.[45]

Information protection and participant confidentiality were paramount to attract the appropriate operational-level participants. First, information collected during research remained confidential. At no point during the analysis or findings was there mention of specific participants – either civilian or military. The researcher never revealed names, ages, titles, ranks, and current positions to protect player confidentiality. The study generalized information pertaining personal experiences for the same reason. Because the Department of Defense (DoD) maintains both authority and access to the information network on Fort Leavenworth, the researcher stored zero data on government computers.

Additionally, data storage remained on personal property. Physical documents, when not in use, remained locked in a safe. Digital information remained stored on the hard drive of a personal device, encrypted. Cloud-based servers stored no research data. Except for semi-structured interview summaries, the internet was not used to store or transmit collected data. Because of the distance between the primary researcher and participants, the researcher may have emailed interview summaries to players for approval.

[45] See Appendix E, Initial Consent Form, Created by Author; See Appendix F, Post Game Consent Form, Created by Author.

Recruitment of US Army candidates relied on email, telephone, and direct dialogue. DTAC professors served as a surrogates for commanding generals. For the serious board-gamers, the researcher scouted potential players at board game venues within Kansas City. Participants received zero compensation for their time. Additionally, as the information collected in the study is speculative and the researcher is not a psychologist, individual results and data collection were not released to participants.

There were two potential limitations to the proposed research project. First, as the research was voluntary, participants may not have had enough interest to volunteer. This limitation was mitigated by attempting to access intrinsic motivations to help improve the quality of the US Army profession. Time was the second critical factor. The primary researcher estimated that participants would devote no less than three hours to the study: 30 minutes for the questionnaire, an hour for the game, another hour for the semi-structured interview, and approximately thirty minutes to review the interview summary. To mitigate this, the researcher spread the experiment over multiple days.

After conducting all required research and analysis, graphs and charts depicted the relationship between experience and self-efficacy. Survey questions collected data on a participant's perceived level of self-efficacy, possibly quantifying exposure to the operational level of war. As informed by the literature review, the survey focused on levels of confidence on intelligence in understanding a complex adaptive system, mission command in regards to planning and decisions, and the gets results leader attribute. The survey measured each independent variables by category. The primary researcher used tables, signifying the difference in perceived self-efficacy.

When illustrating the win-loss ratio between civilian and military participants for the game method, a column chart depicted the aggregate number of wins per population. Coupled with the win-loss data, additional tables provide the information to compare DTAC instructors' and civilian gamers' ability and perceived self-efficacy. For the semi-structured interviews, the

researcher looked for similarities in answers for each participating group. Themes included levels of confidence during decisionmaking, accepting risk, and planning with limited information. In discussion and recommendations, the researcher quoted participants' salient points about each theme. Quotes did not identify the IPI of the participant. Results from all three data collection methods were compared to the theoretical models. Analysis will shape the inquiry on self-efficacy and its possible return to doctrine.

Effective decisionmaking includes having the essential ability for the task and the fundamental personal belief in one's self to accomplish the task. Though doctrine provides the US Army's approved theory for decisionmaking, practice creates a real experience that serves as an initial point for metacognition. As the complexities of the world continue to increase, the anticipation of the unforeseen becomes ever more challenging. If the reintroduction of self-efficacy into the US Army lexicon results in balancing results with personal beliefs, then military leaders may have a useful and cost-effective tool for leader development.

Results

Although the research method utilized three tools to collect the participant's perceived self-efficacy, there were unforeseen issues associated with each tool. For the surveys, civilian recreational gamers required a detailed explanation of the duties and responsibilities associated with division command; these participants also lacked a fundamental understanding of the scale and scope of a division. Both tactics instructors and civilian gamers requested clarity on what constituted a serious-board game. Finally, multiple participants in both groups identified similarities in questions from the survey's structure and syntax. This might have skewed answers if these participants believed in the transference of skillsets between divisional warfare and analog wargaming.

Self-Efficacy Survey

Survey data identified each group as having a higher level of self-efficacy within the type of ability the participants had the most experience with, confirming Hypothesis One. Tacticians had elevated self-efficacy scores related to military skills while the civilians identified with serious gaming. Surprisingly, data invalidated Hypothesis Two because each group rated their self-efficacy over 50 points in each category. Predictions expected to see efficacy averages lower than 50 points because of the lack of experience with the unfamiliar task. Instead, neither group's averaged self-efficacy scores fell below a score of 60, 10 points higher than hypothesized.

Table 1. Self-Efficacy Survey Results per Group by Category

Perceived Self-Efficacy	Participating Groups		Difference Between Groups
	DTAC Instructors	Civilian Board-Gamers	
Military	69.01	61.71	+7.30
Serious Gaming	63.48	71.29	-7.81
Difference Within Skill	5.53	9.58	N/A

Source: The Author.

Hypothesis Three assumed that each group would establish at least a 10-point difference between military and board gaming self-efficacy. While the civilians were .42 points from achieving the mark, the tactics professors maintained a relatively close difference between measured efficacy for each ability. Results invalidate Hypothesis Three. Additionally, when comparing the difference of a main self-efficacy category against the two participating groups, there is roughly a seven-point difference. With an equal amount of questions regarding confidence during division operations and during gaming, forecasted results expected that the experiences of each participating group would balance self-efficacy scores. The game questions would temper the assumed higher scores for division operations for the DTAC instructors. Survey results generally followed this prediction. Collected data comparing self-efficacy for intelligence, mission command, and the gets results attribute reinforced this finding.

Table 2. Self-Efficacy Survey Results by Independent Variables

Function or Attribute	Participating Groups		Difference
	DTAC Instructors	Civilian Board-Gamers	
Intelligence [A]	61.69	59.75	+1.94
Mission Command [A]	71.67	60.49	+11.18
Gets Results [B]	63.86	56.25	+7.61

Notes:
[A] War-Fighting Function
[B] Army Leader Competency
+ Indicates difference favoring DTAC instructors
- Indicates difference in favor of civilian gamers

Source: The Author.

The DTAC instructors exhibited strong convictions to the gets results competency. Of the four military gets results questions, the military professors scored higher levels of perceived self-efficacy on three questions – 75%. DTAC exhibited significantly stronger efficacy than their civilian counterparts, with at least a minimum difference of 20 points between averages. Of note, confidence soared when DTAC participants compared their self-efficacy against VOPFOR academy trained personnel. The civilian board-gamers also identified a high level of victor efficacy when playing analog wargames. Civilian gamers scored significantly higher than the tacticians when asked if they could win a game against another person. When asked to compare levels of confidence against named entities – those with similar experiences, other serious gamers, and graduates of the VOPFOR academy – efficacy reduced dramatically. The board gamers' recession led to the DTAC group scoring higher levels of gaming gets results efficacy against similarity trained individuals, denoted on question 16. Overall, the DTAC instructors displayed a higher level of self-efficacy to win, regardless of the medium in which they must accomplish their task.

Table 3. Survey Comparison of the Gets Results Army Leader Attribute Efficacy

#	Question	Military	Civilian	Difference
1	As a commander at the division-level, I can achieve my objective and end-state conditions against any enemy threat. [A]	69.17	47.5	+21.67

#	Question	Military	Civilian	Difference
2	As a commander at the division-level, I can achieve my objective and end-state conditions against another commander who has had similar training and experiences as me. [A]	82.50	56.67	+25.83
3	As a commander at the division-level, I can achieve my objective and end-state conditions against a civilian that regularly plays board games. [A]	69.17	71.67	-2.50
4	As a commander at the division-level, I can achieve my objective and end-state conditions against a graduate of the Virtual Opposing Forces Academy. [A]	65.00	29.17	+35.83
15	I can win a 1-on-1 serious wargame against another person. [B]	57.50	65.34	-10.84
16	I can win a 1-on-1 serious wargame against another person who has had similar training and experiences as me. [B]	68.34	63.34	+5.00
17	I can win a 1-on-1 serious wargame against a civilian that regularly plays serious games. [B]	58.34	63.34	-5.00
18	I can win a 1-on-1 serious wargame against a graduate of the Virtual Opposing Forces Academy. [B]	50.00	50.00	0.00
Group Perceived Gets Results Self-Efficacy Scores		63.86	56.25	+7.61

Notes:
[A] Questions related to Division Operations
[B] Questions related to Recreational Analog Wargaming
+ Indicates difference in favor of DTAC instructors
- Indicates difference in favor of civilian gamers

Source: The Author.

The survey results for the intelligence warfighting function exhibited no significant difference in efficacy between the participating groups. Tactics professionals outscored their civilian counterparts on all four military intelligence questions, with DTAC answering three questions with significantly more self-efficacy. Board-gamers answered three-of-four wargaming questions with significantly more confidence. There was no difference between groups for question 20. This trend, however, failed to materialize with the mission command results.

Table 4. Survey Comparison of the Intelligence War-Fighting Function Efficacy

#	Question	Military	Civilian	Difference
5	I can identify an enemy's COA at the beginning of a division operation. [A]	61.67	38.50	+23.17
7	I can identify an enemy's COA before the enemy has reached the decisive point (the point at which the probability of success it highly in the opponent's favor) during a division operation. [A]	69.17	56.67	+12.50
8	I can accurately anticipate enemy actions during division operations. [A]	62.50	52.50	+10.00
9	I can identify the enemy's main body or center of gravity during a division operation. [A]	67.17	63.33	+3.84
20	I can identify an opponent's plan during a 1-on-1 serious wargame. [B]	50.00	50.00	0.00
21	I can identify an opponent's plan before he or she has reached the decisive point (the point at which the probability of success it highly in the opponent's favor) during a 1-on-1 serious wargame. [B]	60.00	76.67	-16.67
22	I can accurately anticipate my opponent's moves during a 1-on-1 serious wargame. [B]	55.83	66.67	-10.84
23	I can identify my opponent's main body or center of gravity during a 1-on-1 serious wargame. [B]	62.50	72.50	-10.00
Group Perceived Intelligence Self-Efficacy Scores		61.69	59.75	+1.94

Notes:
[A] Questions related to Division Operations
[B] Questions related to Recreational Analog Wargaming
+ Indicates difference in favor of DTAC instructors
- Indicates difference in favor of civilian gamers

Source: The Author.

The Mission Command War-Fighting Function survey questions saw the most substantial disparity between the two participating groups. DTAC professors scored significantly higher on all five division-related questions. The average DTAC self-efficacy for questions 10 through 14 was 74.80. The civilian gamers did not exude such confidence with these questions; however, the gamers replicated a similar score to the tacticians when answering game-related questions. The recreational gamers' self-efficacy average for questions 24 through 28 was 74.40, a .40

difference. With such similar scores, one would expect to see similar efficacy averages between groups; this is not true. When answering division-related questions, civilian participants denoted low efficacy scores. When answering questions 24 through 28, DTAC instructors averaged a score of 70.34, a difference of 3.66 when compared to DTAC division-related ratings. The tacticians' gaming efficacy, though less than the civilian group, was a minor deviation for their overall perceived mission command self-efficacy. The DTAC group identified as having more efficacy than their civilian opponents when making timely decisions.

Table 5. Survey Comparison of the Mission Command War-Fighting Function Efficacy

#	Question	DTAC	Civilian	Difference
10	I can visualize a FASD-C friendly COA at the beginning of hostilities during a division operation. [A]	73.34	63.34	+10.00
11	I can task organize to achieve the desired effects within my COA before the start of a division operation. [A]	75.84	62.50	+13.34
12	I can accurately weight risks and opportunities during division operations. [A]	74.17	47.50	+26.67
13	I make timely (decisive) choices during division-level operations. [A]	75.84	49.34	+26.50
14	I can adapt my COA to account for enemy counteractions during a division operation. [A]	70.83	60.00	+10.83
24	I can visualize a workable plan at the beginning of a 1-on-1 serious wargame. [B]	67.50	81.17	-13.67
25	I can group resources together to achieve the desired effects within my plan during a 1-on-1 serious wargame. [B]	71.67	77.50	-5.83
26	I can accurately weight risks and opportunities during a 1-on-1 serious wargame. [B]	72.50	74.17	-1.67
27	I make timely (decisive) choices during a 1-on-1 serious wargame. [B]	70.84	65.84	+5.00
28	I can adapt my plan to account for my opponent's gameplay during a 1-on-1 serious wargame. [B]	69.17	73.34	-4.17
Group Perceived Mission Command Self-Efficacy Scores		71.67	60.49	+11.18

Notes:
[A] Questions related to Division Operations
[B] Questions related to Recreation Analog Wargaming
+ Indicates difference in favor of DTAC instructors
- Indicates difference in favor of civilian gamers

Source: The Author.

Wargame Practicum and Interviews

The survey revealed higher levels of perceived self-efficacy within military professionals than civilian gamers. While the survey provided ratings of confidence, an analog board game allowed for a controlled environment where participants could track their self-efficacy in a particularly complex environment. The survey collected on three self-efficacy variables within two broad categories; the practicum limited collection to the intelligence warfighting function and the gets results leader attribute. Specifically, cross-referencing initial self-efficacy survey scores with in-game collected data provided a means to track changes in confidence. Victory correlated with the gets results leader attribute. No data collection directly linked to the mission command function, a limit of the wargame tool. However, those who achieved victory may have done so in part by the utilization of this warfighting function.

While the study is proof of concept and does not reach statistical significance, it is still surprising that the DTAC professors lost two games against serious board-gamers. Hypothesis Four predicted a win ratio of five-to-one, with the one civilian win accounting for chance. The prediction for the military professors was high because the game focused on operational maneuver. Additionally, despite how the militarists appreciate gaming, these professionals have experience with wargaming. CGSOC utilizes both analog and digital games such as Dextrs, Decisive Action, and Landpower to facilitate division-level tactics instruction. Even the MDMP recommends using games as a method to solve problems, as reflected in Course of Action (COA) Analysis.

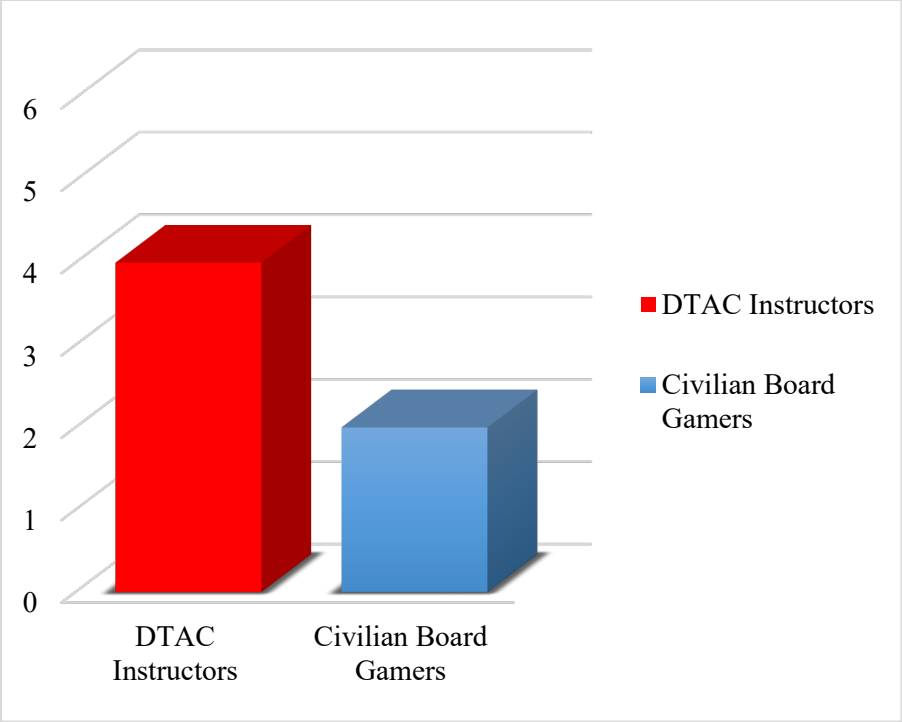

Figure 1. Comparison of Victories Between DTAC Instructors and Civilian Board-Gamers, Created by Author

Comparing accrued experience between the groups, measured in years, makes the two losses more puzzling. The tacticians had a combined total of over 160 years federal service to hone skills. With 370% more experience than the civilians, the instructors should have won 83% of their engagements. Additionally, due to the quantity of board-gamers in Kansas City area without military experience, only two civilians had played serious wargames. The other four civilian participants preferred cooperative or resource-intensive games.

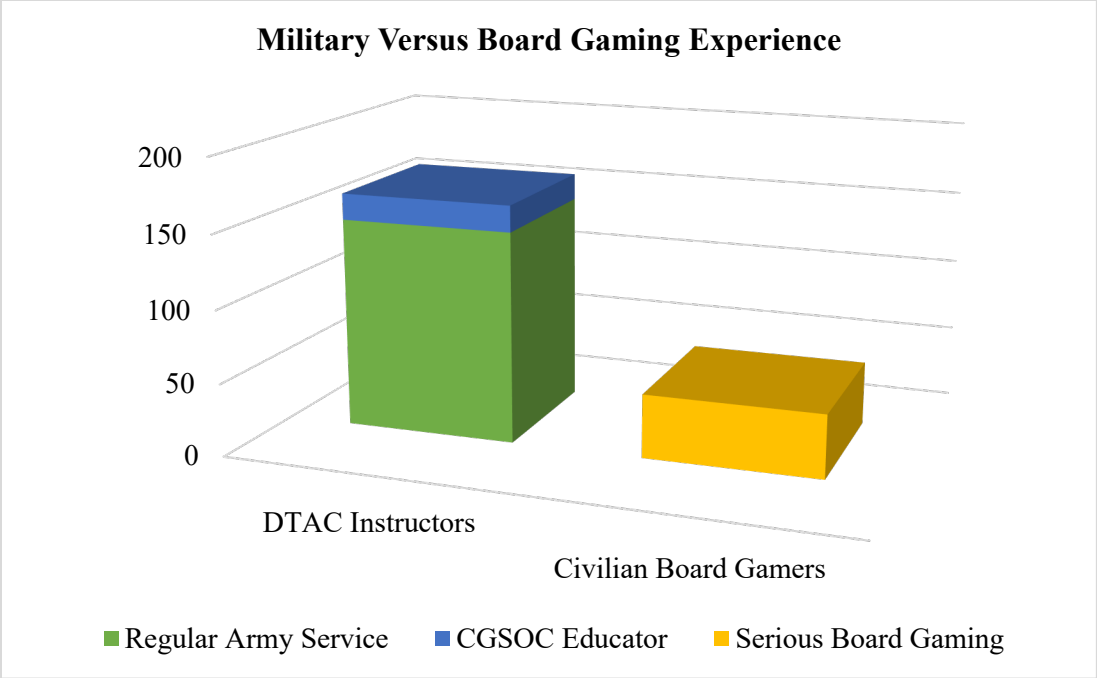

Figure 2. Comparison of Experience Between DTAC Instructors and Civilian Board-Gamers, Created by Author

The results of the experiment validated that each group had more self-efficacy in their category's ability; the military participants had more efficacy in division-level operations while civilian board-gamers rated higher in their gaming confidence. Surprisingly, no group scored lower than 50 points in each independent variable, regardless of the task being military or gaming related. Additionally, independent variable ratings remained relatively close between both groups, again regardless of category. Finally, the militarists exhibited a combination of confidence and ability leading to four victories against opponents. Civilians were disadvantaged with only 27% years of experience in recreational gaming.

Discussion

The confidence showcased by the CGSOC instructors contradicted LtGen(R) Van Riper's 1995 results. However, the current study was not a duplication of his game – it was a replication. DTAC assumed the role of generals; recreational gamers replaced the power suits of Wall Street . New results question LtGen(R) Van Riper's assertion that operational leaders do not make timely

decisions. His statement may not survive when tested to a level of statistical significance. Four victories illustrated DTAC's ability to win; these victories required decisions. The survey, reinforced by the wargame and interviews, highlighted that leaders could act rapidly, with actions derived from cognitive decisions. Besides questioning the efficacy and ability of operational leaders, current research shed light as to how efficacy shaped those decisions.

The Dunning-Kruger Effect

The most common trait observed in the study was the widespread overconfidence displayed by participants. Every participant overestimated their abilities, signaling the Dunning-Kruger Effect. Psychologists identified that incompetence leads to poor decisions. Because of the lack of competence, these same individuals cannot correctly identify their lack of ability. The combination results in experiences reinforcing perceived abilities; incompetent individuals remain wedded to their confidence regardless of outcomes.[46] David Dunning and Justin Kruger initially conducted four studies observing a wide range of skillsets. Experiments covered abilities such as delivering a joke, English rhetoric, and logical reasoning.[47] Other researchers explored the Dunning-Kruger Effect on competitive bridge players, vocabulary, basic drivers' education, and informational literacy.[48] Results generally found that research participants, regardless of the skill under review, overestimated their ability. The Dunning-Kruger Effect likely impacted both militarists and gamers.

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[46] Justin Kruger and David Dunning, "Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments," *Journal of Personality and Social Psychology* 77, no. 6 (1999): 1130.

[47] Ibid., 1123–1129.

[48] Daniel J Simmons, "Unskilled and Optimistic: Overconfident Predictions Despite Knowledge of Relative Skill," *Psychonomic Bulletin and Review* 20 (2013): 603; Khalid Mahmood, "Do People Overestimate Their Information Literacy Skills? A Systematic Review of Empirical Evidence on the Dunning-Kruger Effect," *Communications in Information Literacy* 10, no. 2 (2016): 202–203; Erik Hoelzl and Aldo Rustichini, "Overconfident: Do You Put Your Money on It?," *The Economic Journal* 115, no. 503 (April 2005): 308; Ulrike Malmendier and Timothy Taylor, "On the Verges of Overconfidence," *The Journal of Economic Perspectives* 29, no. 4 (Fall 2015): 4.

Those acting under the Dunning-Kruger Effect may have other compounding negative behaviors. Research linked Dunning-Kruger with over-optimism. Moreover, studies found that those that do not receive feedback remain anchored to their self-efficacy. Other biases may aid individuals with maintaining their false belief in their abilities.[49] Anchoring or any other bias inhibits System 2 thinking.[50] Biases act as a blinding agent; the experience only reinforces the bias. In 2008, additional research implied that the effect might correlate with attribution theory and "saving face" due to poor performance.[51]

Dunning and Kruger hypothesized that people could overcome their incompetence. They validated this idea by conducting a study where low-performing individuals separated into two groups. One group received remedial training while the other did not. When retested, those who received retraining not only improved their ability, they were significantly more accurate with their prediction of how they were going to score on the exam. The study "revealed a paradox. It suggested that one way to make people recognize their incompetence [was] to make them competent."[52] These psychologists believed that metacognition was critical in making sense of experiences. Simply put, metacognition improved accuracy.[53] When a person thinks critically about an experience, the reflection increases the probability of the individual gaining understanding as to why the experience occurred the way it did.

Such critical thinking occurred during the impromptu metagaming session between Marshall and Hata.[54] Marshall exhibited signs of attribution theory, followed by critical thinking.

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[49] Malmendier and Taylor, "On the Verges of Overconfidence," 5–6.

[50] Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus, and Giroux, 2011), 22.

[51] Joyce Ehrlinger, et. al., "Why the Unskilled Are Unaware: Further Explorations of (Absent) Self-Insight Among the Incompetent," *Organizational Behavior and Human Decision Processes* 105, no. 1 (January 2008): 98–121, accessed January 24, 2019, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2702783/.

[52] Kruger and Dunning, "Unskilled and Unaware of It," 1131.

[53] Ibid., 1130.

[54] For confidentiality, the study refers to DTAC instructors as US World War II generals; the study refers to civilian board-gamers as Japanese World War II generals.

In gameplay, he exhibited overconfidence. Marshall ascribed part of his failure to game rules, mechanics, and structure. Moreover, he exhibited symptoms of the Dunning-Kruger Effect. When asked about his different efficacy ratings between the survey and the actual game, he believed that there was no significant change. However, on the survey he measured himself between 80 to 90 points confident that he could win in both tasks – serious board gaming and warfighting. During the practicum, Marshall's confidence in his ability to win remained stable at 50%. He exhibited the same trait with his perceived abilities in the intelligence and mission command war-fighting functions. It was after Marshall became more relaxed during the metagaming session that he began reflecting on his actions. After losing the game, Marshall may have been protecting his perception of himself. He needed to decompress before he could accurately reflect on the experience.

Marshall was not the only DTAC instructor to exhibit overconfidence. Although Patton was victorious over Sugiyama, he too rated himself higher on the initial survey than during the operational simulation. Whereas Marshall created a 30-point difference between his survey and game gets results self-efficacy, Patton's margin of overconfidence was much smaller. Patton's warfighting gets results efficacy rivaled his fellow DTAC instructors; however, he averaged a gets results efficacy of 60 points when applied to the serious board-gaming task. Because Patton did not believe in a direct transference of skills between warfighting and wargaming, he maintained a closer relationship between efficacy ratings. He perceived that questions on the survey as "an event," an abstract idea that may never materialize. He viewed his efficacy during the game as "the event," with confidence tested in time and space. The change in reported efficacy suggests that self-efficacy rapidly evolves when applied to a specific situation.

Matsui also exhibited similar self-efficacy ratings as Patton. Matsui averaged a gaming gets results efficacy average score of 41 points. In the game he averaged a rating of 59.25 points, an increase of almost 20 points. While he exhibited a positive trend in is Gets Results efficacy rating, he exhibited Dunning-Kruger symptoms in the war-fighting function confidence ratings.

Matsui and Patton, representing both participating groups, illustrated the necessity of having an accurate baseline perception of self. When the initial anchor point is relatively close – or perhaps even underrated concerning actual ability – it is easier for an individual to forecast how they will act.

Finally, Eisenhower's reflective observations on his in-game actions may confirm Dunning and Kruger's assertion on the relationship between efficacy, metacognition, and competence. After his loss, Eisenhower immediately began to review each action taken by both players. During his metagaming session with Matsui, he candidly discussed his perceived points of failure and made recommendations as to how to modify his approach. He identified the inability to control the tempo of the battle and hypothesized multiple new options that he could test in future gameplay. Though he lost his battle against Matusi, he quickly advanced through the experiential learning model and readied himself for the next game.

Initially, Matusi and the other participants did not see a relationship between the Dunning-Kruger Effect and self-efficacy. But, when stitched together, these theories identify how overconfidence – or those with an exaggerated amount of self-efficacy – may overextend abilities. Both theories relate to specific tasks. Moreover, the Dunning-Kruger Effect and self-efficacy use perceived levels of confidence as the currency to measure individuals. While self-efficacy provides the language to describe where one's efficacy stands on the spectrum of confidence, the Dunning-Kruger Effect describes an extreme of self-efficacy where incompetence inhibits the ability to recognize and adjust for systemic failure.

Examine how different levels of confidence may shape an individual. Suppose someone with low ability at the operational level of war had to make an operational decision. High self-efficacy paired with low ability significantly increases the probability of a poor, ineffective decision. Compiled data supports this position. At the opposite end of the spectrum, an individual with low self-efficacy and low task-ability may not even decide or may choose to lean heavily on advice from subject matter experts. The combination of low efficacy and ability may lead to

inaction, regardless of the individual cognitively deciding on what action to execute. Translating the perceived cognitive solution into actions is more important to operational leaders than just deciding on what action to take.

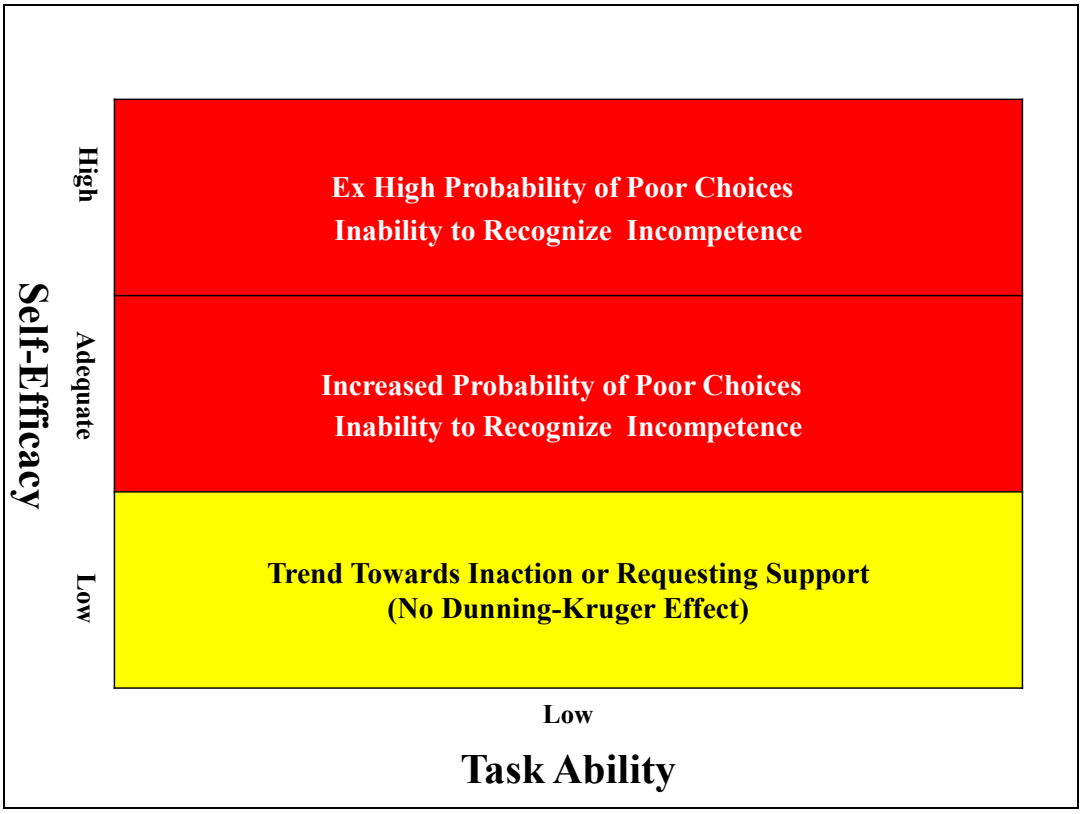

Figure 3. Impact of Dunning-Kruger Effect on Individuals with Low Ability, Created by Author

The Impostor Phenomenon

While the Dunning-Kruger Effect many explain why so many operational decisionmakers were overconfident in their perceived abilities, there was an equally devastating inverse for those who exhibit low self-efficacy and exceptionally high task performance. Can those with low to no self-confidence and high competency make effective operational decisions? Research began on this topic in the 1970s by Pauline Clance and Suzanne Imes, who created the Impostor Phenomenon. Although more than capable in a specific task, people exhibiting the syndrome view themselves as frauds and believe that it is inevitable that someone will expose their lack of

skill.[55] A high-achieving academic student illustrated the phenomenon when she stated, "I was convinced that I would be discovered as a phony when I took my comprehensive exam."[56] The Impostor Phenomenon creates an opportunity for inaction, as there is a fundamental lack of belief in one's ability. Described as a maladaptive personality trait, depression, anxiety, personal inflexibility, low self-confidence, and frustration are associated with the syndrome.[57] While one may believe that these actions would lead to self-destruction, impostors manifest many positive behaviors; specifically, they exhibit diligence and dedication to task accomplishment.[58] Those operating under the impostor syndrome attach great value to the perceived praises and reprimands from supervisors.[59]

For those individuals living as impostors, the remarks and comments delivered by supervisors and peers distort the meaning that is usually derived from concrete experience. Collegiate students afflicted with the phenomenon identified that they viewed themselves holistically as an amalgamation of skills developed through experiences and guided by the opinions of key individuals.[60] Anxiety and low self-confidence may impact impostors. For instance, an individual may know how to proceed in a situation based on their previous experience; however, cognition fails to translate into timely action because the individual lacks belief in their decisionmaking ability and their skill. Decisions, when translated into action, lead

[55] Pauline Rose Clance and Suzanne Ament Imes, "The Impostor Phenomenon in High Achieving Women: Dynamics and Therapeutic Intervention," *Psychotherapy: Theory, Research and Practice* 15, no. 3 (Fall 1978): 243; Jasmine Vergauwe et. al., "Fear of Being Exposed: The Trait-Relatedness of the Impostor Phenomenon and Its Relevance in the Work Context," *Journal of Business and Psychology* 30, no. 3 (September 2015): 566; Frank Pajaras, "Toward a Positive Psychology of Academic Motivation," *The Journal of Educational Research* 95, no. 1 (October 2001): 28.

[56] Clance and Imes, "The Impostor Phenomenon in High Achieving Women," 241.

[57] Vergauwe et al., "Fear of Being Exposed," 567; Clance and Imes, "The Impostor Phenomenon in High Achieving Women," 242; Pajaras, "Toward a Positive Psychology of Academic Motivation," 28.

[58] Clance and Imes, "The Impostor Phenomenon in High Achieving Women," 243–245.

[59] Nick Schubert, "The Impostor Phenomenon: Insecurity Cloaked in Success" (Masters Thesis, Carleon University, 2013), 59.

[60] Pajaras, "Toward a Positive Psychology of Academic Motivation," 29.

to results. In the mind of an impostor, the result of their decision only highlights supposed incompetence and exposes them as a fraud. Under this method of reasoning, no decision or a postponed decision is more favorable because it delays the moment when a peer or supervisor identifies their unrealistic incompetence.

Jasmine Verganwe and her team reminded researchers that task proficiency and cognitive states are not static, nor are these states binary. It is not a matter of if a person is or is not an impostor; the challenge is to determine where individuals exist on a sliding scale of impostor tendencies.[61] Answers during the semi-structured interviews identified one participant who significantly exhibited the impostor syndrome. What most participants discussed were minor levels of self-doubt. Because the practicum was a wargame, both participating groups may have had enough belief in their experiences to overcome impostor tendencies. This aligns with Jane Roskowski's research on counselor self-efficacy which identified those who continue to practice in a particular field of study overcome impostor tendencies as experience increases.[62] Nick Schubert agrees, finding that older individuals, such as the DTAC instructors, do not report indicators of the impostor phenomena when compared to younger generations.[63]

The semi-structured interviews affirm Schubert and Roskowski's ideas about the impostor phenomena. Only one DTAC instructor significantly conveyed any notion of anxiety in regards to decisonmaking. MacArthur's experience exemplified the average DTAC professor. After his victory over Yamashita, he expressed that he had some self-doubt; however, this doubt never reached a threshold that impacted his ability to implement a decision. The inability of MacArthur to know with certainty whether Yamashita deployed a deception force or fixing force slightly impacted his intelligence self-efficacy rating during the practicum.

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[61] Vergauwe et al., "Fear of Being Exposed," 576.

[62] Jane C Royse Roskowski, "Impostor Phenomenon and Counseling Self-Efficacy: The Impact of Impostor Feelings" (PhD Dissertation, Ball State University, 2010), 150.

[63] Schubert, "The Impostor Phenomenon," 60.

The civilian board-gamers also signaled self-doubt, a precursor to the impostor syndrome. Terauchi, in his battle against Bradley, allowed self-doubt to impact decisionmaking. Unable to stop Bradley's slow but effective advance along the eastern approach, Terauchi conducted an attack on the opposite side of the board where there were fewer enemy forces. On the initial western encounter, he received more damage than he initially calculated; yet he still maintained a higher probability of success. Bradley was out of position to significantly reinforce. However, Terauchi halted his attack and retreated, allowing his opponent to reposition forces. Terauchi admitted that he stopped the assault because he doubted himself. He knew the approximate probability of success but did not believe that he could achieve his goal. While Terauchi did doubt his abilities, resulting in a poor decision, collected data does not suggest a strong correlation between the Impostor Phenomenon with either participating group. Both groups exhibited minor levels of self-doubt. This doubt suggests that the participants were on the low side of the impostor spectrum.

While MacArthur and Terauchi illustrated minor episodes of doubt, Clark demonstrated more indicators of the Impostor Phenomenon. After a successful attack against Tojo, Clark had the conditions for an outright victory in two turns. However, he became overly cautious and questioned the strength of remaining enemy units – even though his opponent's combat effectiveness had not changed from the previous turn. Clark had seen the strength of almost all remaining enemy forces that could affect his operation. He reduced tempo because he lacked confidence in his ability. Self-doubt translated his decision into sluggish tempo, allowing Tojo to reframe and double the length of the game.

Clark illustrated impostor tendencies. Interestingly, when returning his survey he mentioned, "I would have written higher numbers, but I knew you were going to test me. So, I lowered them." It is as if he combined the worst aspects of the Dunning-Kruger Effect with the Impostor Phenomenon. Between his survey results, victory over Tojo, and interview responses, he exhibited over time both overconfidence and high ability. Strikingly, during his metagame

session, he stated, “I had no faith going into this.” The statement of a former infantry battalion commander bears extreme resemblance to the academic impostor who confided in Clance almost 50 years ago.

Clark’s case illustrates that the Impostor Phenomenon is naturally low self-efficacy with exceptional ability, another extreme on a spectrum of confidence. Research in positive psychology affirms that self-efficacy is a reliable indicator of the syndrome.[64] Seen in figure four, low ability and low self-efficacy result in poor leadership. As ability increases and self-efficacy remains anchored within the lower category, individuals exhibit more impostor tendencies. These individuals’ inability to believe in their skills may prevent decisions from being made in a timely fashion. Impostors may make no decision at all. Just as a lack of competence hinders those with overconfidence, the impostor phenomenon prevents individuals from accepting their high-performing ability as truth.

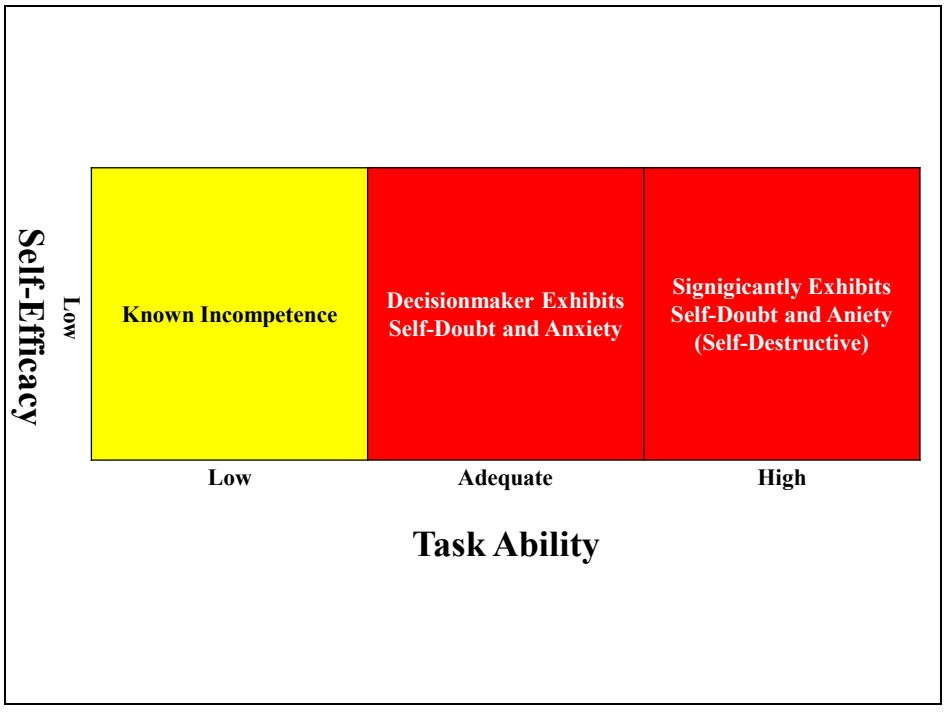

Figure 4. Impact of Impostor Phenomenon Concerning Task Ability, Created by Author

[64] Pajaras, “Toward a Positive Psychology of Academic Motivation,” 32; Vergauwe et al., “Fear of Being Exposed,” 574.

Recommendations

Returning Self-Efficacy to Doctrine

An initial theory of self-efficacy for decisionmaking emerged from the study. The re-insertion of the term into *Field Manual 6-22, Army Leadership,* would more than likely not crystallize into the Army's counseling and mentorship language. Instead, doctrine writers must optimize self-efficacy for smooth integration into the already established counseling system. Figure five illustrates an initial framework for discussing career progression. As doctrine's developmental process primarily relies on experience, incorporating Bandura's five methods for efficacy development may align the development of skill with the equally important step of developing confidence, creating a more self-aware leader. The figure below identifies five potential categories a subordinate may be operating within. Known incompetence, the least skilled and least efficacious category, identifies areas where an individual has minimal confidence or ability. Because the individual acknowledges the lack of ability, individuals do not make decisions.

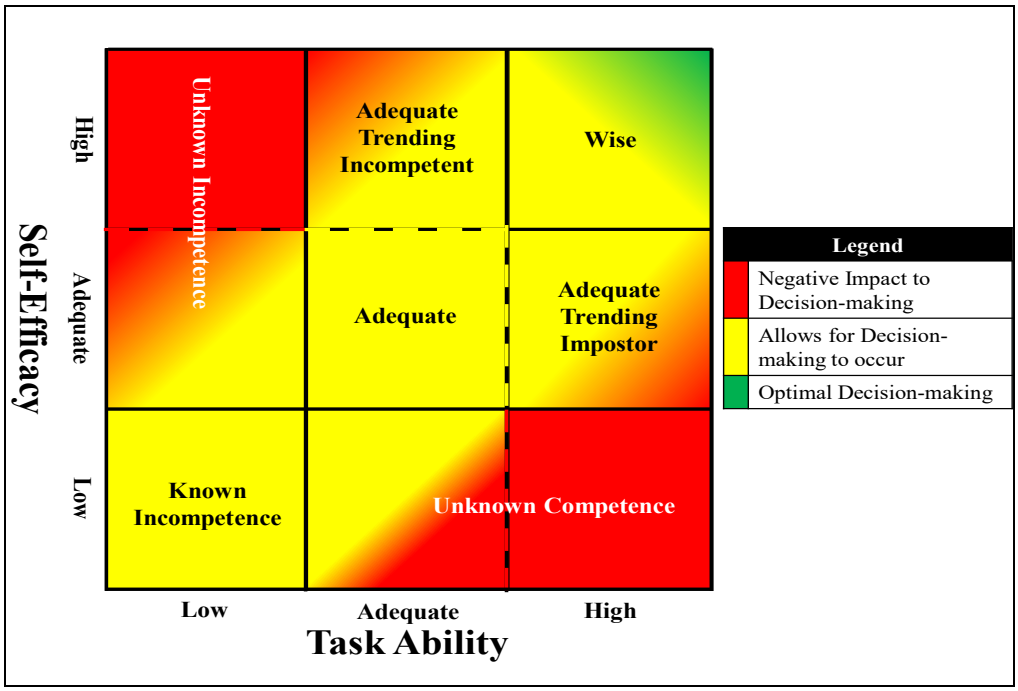

Figure 5. Generalized Impact of Self-Efficacy Concerning Task Ability, Created by Author

Unknown incompetence identifies individuals with more self-efficacy than ability. This quadrant of the chart accounts for the Dunning-Kruger Effect. Aligning with the psychologists' findings, decisionmakers in this category take action outside of their abilities and overinflate their confidence, especially in complex tasks. The lower right quadrant, unknown competence, defines individuals who have a record of high performance but are hindered by a lack of confidence, accounting for the Impostor Phenomenon.

Leaders strive for the upper right quadrant of the above figure. Wisdom is the balance of high ability with high self-efficacy. This near-perfect balance might be aspirational at best. Dunning and Kruger found that high achievers slightly underestimated their abilities.[65]

Researching to Determine Statistical Significance

Because not all DTAC participants were victorious, experience cannot be the only unit of measure in determining effective decisionmaking. A similar study should be conducted to a level of statistical significance to validate this study's findings. Also, the CGSOC tacticians served as surrogates for operational decisionmakers. Because of this, the US Army should test currently serving operational leaders. The study assumed that those commanding divisions have more experience than DTAC instructors. With doctrine transitioning to LSCO, the Army may be able to identify leaders whose abilities and self-efficacy in LSCO-related tasks are already closely correlated.

Besides identifying those with the potential to decide and act during great power competition, the US Army should research the impact of impostors within organizations. While these self-perceived frauds may naturally separate from the Army as cadets and junior officers, there may be an opportunity to shape and mentor these individuals into productive decisionmakers. The Army should collect data across all echelons, measuring self-efficacy to

[65] Kruger and Dunning, "Unskilled and Unaware of It," 1131.

determine trends denoting the Impostor Phenomenon and the widely assumed Dunning-Kruger Effect.

Additionally, the US Army should continue to explore the the combination of wargaming with counseling. Wargames provide an experience that naturally lends itself to metacognition. Metagaming occurred immediately after all but one game without prompting by the researcher. The game provided individuals a place to experiment, test abilities, and adjust confidence accordingly. Psychologist Dietrich Dörner agrees. "Anyone who thinks play is nothing but play and dead earnest nothing but dead earnest hasn't understood either one."[66]

Conclusion

Research uncovered that most individuals did not effectively correlate their perceived self-efficacy with actual abilities. The study confirmed both confidence and ability impact decisionmaking. Leaders may trend towards the Dunning-Kruger Effect. Inversely, a "Clark" may be serving in important operational positions, believing that they are an impostor.

The study identified that participants had enough efficacy to act; however, most participants failed to align self-efficacy with skill. Misalignment lends itself to overaggressive decisions or meek actions, neither of which are effective. Experience remains the most effective tool in developing confidence and skill. Reintroduction of self-efficacy into Army doctrine provides supervisors another tool to create well-rounded decisionmakers. Leaders well-versed in self-efficacy could harmonize vicarious experiences, verbal persuasion, and emotional arousal to build confidence within subordinates.

Had COL Tack known about self-efficacy, ability, and his penchant of overconfidence, he may have bypassed his stay in purgatory, kept more men alive in combat, and he may have actually contributed to the US Army's mandate to win the nation's wars. Had he began his career

[66] Dietrich Dörner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York: Basic Books, 1989), 199.

knowing that he needed a healthy diet of experience, confidence, metacognition, and mentorship, his progression would have evolved differently. Perhaps he would have followed a path resembling that of Ender Wiggins in *Ender's Game*. With Ender's efficacy guided by the brutally honest feedback of COL Graff, he learned from experience and shaped his confidence and skills in simulation – wargames.[67]

Done correctly, deterrence prevents conflict. Peace, however, delivers an unintended consequence. It starves military leaders of actual experience. Games, regardless of naming convention, serve a means to develop ability and efficacy. The game is not "real education" but a forecasted reality where those who might have to decide and act can practice, reflect, and learn - all while increasing skills and confidence. It is better to identify operational leaders who can make effective decisions in a game than conducting this same development in contact. Adversaries will not provide the time to develop operational leaders during a war – ask COL Always A. Tack how it worked out for him.

[67] Orson Scott Card, *Ender's Game* (New York: Tom Doherty Associates, 1977), 182.

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Appendix A: Operational Decisionmaking Survey

The purpose of this questionnaire is to collect data on the leadership capabilities and experiences of participants. Please mark the upper right-hand corner of this page with your participant number; do not put your name on this form. You have an unlimited amount of time to complete this questionnaire.

On a scale of 0 to 100, with zero equating to no confidence and 100 indicating absolute confidence, please indicate you how assess your level of confidence on the following tasks.

#	Assertions	Rating
1	As a commander at the division-level, I can achieve my objective and end-state conditions against any enemy threat.	
2	As a commander at the division-level, I can achieve my objective and end-state conditions against another commander who has had similar training and experiences as me.	
3	As a commander at the division-level, I can achieve my objective and end-state conditions against a civilian that regularly plays board games.	
4	As a commander at the division-level, I can achieve my objective and end-state conditions against a graduate of the Virtual Opposing Forces Academy.	
5	I can identify an enemy's COA at the beginning of division operation.	
6	I can identify an enemy's COA before the enemy has reached the decisive point (point at which the probability of success it highly in the opponent's favor) during a division operation.	
7	I can accurately anticipate enemy actions during division operations.	
8	I can identify the enemy's main body or center of gravity during a division operation.	
9	I can visualize a FASD-C friendly COA at the beginning of hostilities during a division operation.	
10	I can task organize to achieve the desired effects within my COA before the start of a division operation.	
11	I can accurately weight risks and opportunities during division operations.	
12	I make timely (decisive) choices during division-level operations.	
13	I can adapt my COA to account for enemy counteractions during a division operation.	

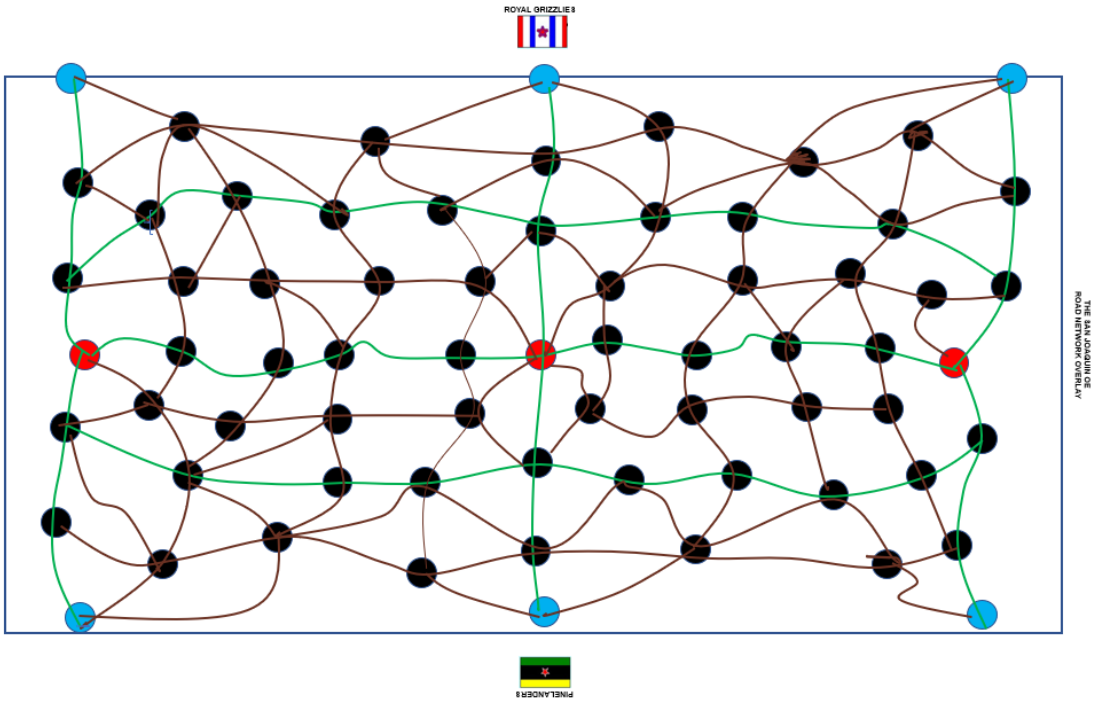
#	Assertions	Rating
14	I can win a 1-on-1 serious wargame against another person.	
15	I can win a 1-on-1 serious wargame against another person who has had similar training and experiences as me.	
16	I can win a 1-on-1 serious wargame against a civilian that regularly plays serious board games.	
17	I can win a 1-on-1 serious wargame against a graduate of the Virtual Opposing Forces Academy.	
18	I can identify an opponent's plan at the beginning of a 1-on-1 serious wargame.	
19	I can identify an opponent's plan before he or she has reached the decisive point (point at which the probability of success it highly in the opponent's favor) during a 1-on-1 serious wargame.	
20	I can accurately anticipate my opponent's moves during a 1-on-1 serious wargame.	
21	I can identify my opponent's main body or center of gravity during a 1-on-1 serious wargame.	
22	I can visualize a workable plan at the beginning of a 1-on-1 serious wargame.	
23	I can group resources together to achieve the desired effects within my plan during a 1-on-1 serious wargame.	
24	I can accurately weight risks and opportunities during a 1-on-1 serious wargame.	
25	I make timely (decisive) choices during a 1-on-1 serious wargame.	
26	I can adapt my plan to account for my opponent's gameplay during a 1-on-1 serious wargame.	

Based on your previous experiences, please answer the following questions.

27	How often do you play recreational board games (daily, weekly, bi-weekly, monthly, seldom)?	
28	How often do you play serious board games (examples - Triumph and Tragedy, Friedrich, Race to the Rhine) (daily, weekly, bi-weekly, monthly, seldom)?	
29	How often do you play video games of any time (incudes games on mobile devices)? (daily, weekly, bi-weekly, monthly, seldom)	
30	How many years have you played serious board games?	
31	How many years do you have in the US Regular Army?	
32	How many years do you have in the US Army Reserve?	
33	How many years do you have in the US Army National Guard?	

34	How many years do you have as a DTAC instructor?	
35	How many division staffs have you served on?	
36	How many division-level MCTP exercises have you participated in?	
37	How many other division-level exercises have you participated in?	
38	Have you served as an observer/controller-trainer at the MCTP; if so, how many rotations did you observe division level-operations conducting LSCO?	
39	Please describe any other field exercises that you believe significantly impacted your leadership abilities at the division-level.	

Appendix B: Game Sketch Map



Appendix C: Game Rules

Introduction & Intelligence Estimate

You will be playing a self-created, block, turn-based, war-game designed to replicate the key elements of the operational level of war. One player commands a division from the Pineland California Army while the other player leads a division of the Royal Grizzly Bear Army. In this future history, an earthquake has severed California from the continental United States. Using the physical separation of California from the remainder the mainland of the United States, California seceeded. After and uncontested secession, the new Californian government collapsed, plunging the state into a war between two newly formed factions: the Pinelanders of New Northern California and the Royal Order of the Grizzly Bear (which operates in southern California). Both factions are warring for the former San Joaquin Valley for control of resources. As a result of previous operations, your field commander tasked you, the commander of an elite division, to conduct a hasty attack into the San Joaquin Valley. Higher headquarters considers victory for your unit as either seizing two of your opposing forces assembly areas or the destruction of your opposing forces army. The map covers the area of operations. Higher echelon commanders describe the movement to contact as a forceful, terrain focused operation. Intelligence estimate that the enemy has not deploy fresh units into the AO, expect enemy unit at a strength (step) of no more than 2. The goal is to seize two objectives to allow the main body to continue onward movement to crush the enemy.

Game Equipment

The game includes one mapboard, two sets of division pieces (Pinelanders identified by green blocks and Royal Grizzlies identified by blue blocks), ten six-sided dice per player, a sketch map per player, and an analog record sheet.

Mapboard. The mapboard depicts the area of operations Features of the map include cities, assembly areas (AA), and roads. Cities are the most common graphic on the mapboard and

depict where battles occur. Capital cites are marked in green with remaining cities marked in pink. There is no reward for controlling a capital city. Cities can hold an infinite number of units. Assembly area are marked in orange and represent potential starting locations for divisional units. There is no limit to the number of units than can occupy an AA. Roads connect cities to other cities and AAs. There are two types of roads. Interstates, the thick black routes between cities, allow a maximum of eight units to move along a road per turn. County roads, the thin brown routes between cities, allow for a maximum of four units to move along the road per turn.

Division Units. Each player is provided with a set of unit pieces that replicate units. There are four primary types of units: cavalry, infantry, artillery, and commanders. An oval with a slash through it represents cavalry, an X indicates infantry, a black circle marks artillery, and a black circle with two circles below it represents self-propelled artillery. The acronym CDR represents the commander. Pips along the outside corner denote unit strength. For every hit, the block rotates (step-loss), indicating its new strength. Blocks with no marking serve as deception forces and have no strength or combat ability.

Dice. Players roll one six-sided dice per unit when in combat. The game uses dice in conjunction with firepower ratings on unit blocks to determine the number of hits per attack.

Gameplay

The game is played in alternate player turns. Players roll one six-sided dice to determine who has initiative, highest roll wins. The sequence of play is movement followed by battle.

Initial Deployment. Both players simultaneously deploy their units to the field in AAs. The referee places a blinder in the center of the map for the duration of deployment. Players have five minutes to deploy units to the board.

Turns. After the initial deployment of forces, the referee removes the blinder. Whoever won the initiative begins the first turn. Turns consists of a movement phase and a battle phase. During the movement phase, the active player may choose to move units from up to two cities.

All units from a city location do not have to go to the same location; however, players cannot violate movement (road/interstate) restrictions. When moving units more than one city, movement of each unit still impacts a total number of units that can move per interstate or county road. Unit movement rates are below.

Type of Unit	Movement Rate	Forced March Rate	Firepower Rating
Cavalry & SP Artillery	1 -2 segments	3 segments	Hit on 1 or 2
Commanders	1-2 segments	3 segments	Hit on 1 thru 3
Infantry & Artillery	1 segment	2 segments	Hit on 1 or 2
Deception	1-2 segments	3 segments	N/A

Forced marches allow units to move an additional road segment, but may incur damage. When force marching units, the player must declare the forced march and move the units. After the movement is complete, the player rolls one six-sided dice per force marched unit simultaneously to determine if units became exhausted. A die roll of one through three indicates exhaustion and incurs a strength loss (step-loss) of one while a die role four through six replicates a triumphant forced march.

During the combat phase, battles (city locations where both players units are located) occur in the order of the attacking players chooses. A series of alternating battle resolves combat turns. After deciding what battle occurs first, players lay down their board pieces so they are visible to their opponents.

First, players determine if they have achieved a combined arms advantage. The number of commanders and type of units determines combined arms advantage present. For example, the player 1 may have five infantry and two cavalry units while player 2 has one infantry, one cavalry, and one artillery unit. Although player 1 has more units, player 2 would have the combined arms advantage because the player 2 has three types of arms while player 1 possess two. The advantage provides a plus-one modifier to their firepower. For example, infantry with a

firepower rating of F2 would normally hit on a die roll of one or two. With the combined arms advantage, the same infantry unit would hit on a one, two, or three (F3). If both players have an equal number of combined arms, no player has the advantage. Remember, commanders serve as a type of combined arms modifier when determining who has the advantage. If deception forces are part of the battle, deception pieces are removed prior to battle and no not count as a combined arm.

Next, the defending player fires the first volley, rolling dice for artillery, infantry, and cavalry. Although the attacker rolls dice second, firing is simultaneous. Damage is not taken until both players finish firing. When firing, it is best to group units by unit type and firepower to reduce the time required for combat. First, roll for artillery. Artillery units target enemy artillery first, with remaining hit points then distributed between infantry, cavalry, and commanders. Next, the defensive player rolls for infantry and cavalry units. These units do not target specific units; hits are applied evenly across the enemy force. Finally, roll for the commander. Commanders do not target specific units. Next the attacker conducts the same actions as the defender; upon completion of dice rolling, players distribute damage.

The player receiving hits decides which units lose strength. Hits from artillery units must go to artillery units first; only when there are no more enemy artillery units left that artillery hits are applied against other units. Hits impact the highest strength units first. For instance, when taking a strength loss, all units with a four strength must be reduced to a strength of three before units with a strength of three are reduced. After the attacker fires their initial volley, the defender attacks in the same manner as the attacker.

After the volley, players determine if they will hold, retreat or reinforce. Simultaneously, players write down their decision. Players that choose to hold remain on the battlefield but do not reinforce the unit in contact with troops from adjacent cities. If retreat is declared, that party must move all its forces out of the contested city. Retreat movement must first attempt to move back toward initial AAs; however, if opposing forces prevent reward retreat, players may retreat

laterally or forward. Alternatively, players may reinforce units in battle. The road network limits reinforcement as additional units come from adjoining cities no more than one road segment away from the battle location. Interstates allow two units to reinforce from adjoining locations, while country roads allow only one unit. Multiple adjoining cities may simultaneously reinforce. After reinforcement, players check again for a combined arms advantage. If both players maintained a presence in the contested city, play then resumes in the same manner described above. Combat continues until either all enemy units have been destroyed or a player retreats. After all battles are resolved, play then passes to the second player. At the end of each turn, players mark their actions an their duty log.[68]

Victory

To win, a player must seize and retain two opposing force's AAs or destroy their opponent's army. An army is considered destroyed when only six units remain on the board (to include deception units).

[68] See Appendix G, In-Game Duty Log, Created by Author.

Appendix D: Semi-Structured Interview Questions

1. Did your opponent deploy their forces in a manner that you had expected? How did that make you feel?

2. Did you have to change your game plan? If so, what led you to that choice?

3. What emotions were you feeling when you made that decision?

4. Did the game resonate with any experiences, schooling, or training events that you have taken part in?

5. As you conducted initial deployment of forces, how confident did you feel about your ability to win the game?

6. When you first saw your opponent, how confident did you feel in your ability to win the game?

7. How did your previous experiences help you make your decisions?

8. How comfortable did you feel about making decisions when you had imperfect knowledge?

9. How confident did you feel in your ability to correctly assess the situation before deciding to attack?

10. Did your confidence in your abilities change throughout the game?

11. Did your confidence in your ability to win change throughout the game?

Appendix E: Initial Consent Form

Introduction

The research method for this research is a mixed methods approach using a qualitative questionaaire, quantitative operational-level board game, and qualitative semi-structured interviews. A literature review covering adult education, decision making processes, and a review of the operational level of war informed the creation and structure of human research.

Purpose

You are invited to participate in a research study that is part of thesis requirements at the School of Advanced Military Studies at Fort Leavenworth, Kansas. The purpose of the mixed method research approach is to provide baseline data that will allow the researcher to focus on the examination of leadership at the operational level of war and its relevance in today's operational environment. I, as the proprietor of the study, will conduct data collection by the ways previously mentioned, maintaining total confidentiality of all participants. Once the data is collected, data analysis will be conducted to identify any relations between experience and leadership. For military personnel, I am only interested in US Army officers who are serving or have served in key operational-level decision making billets. For civilian participants, I am only interested in those who have a relative amount of experience with serious board games and have never served in the military.

Participation Requirements

I am asking you to participate in a qualitative questionnaire, quantitative serious board game, and a qualitative semi-structured interview. The questionnaire will consist of questions concerning levels of confidence, previous work experiences, civil education, and military education. There is no time requirement associated with the completion of the questionnaire. The questionnaire will not comprise of questions that will present participants with any potential violations of the

Uniformed Code of Military Justice or criminal law, nor will any classified material be contained in the survey.

You will play a self-created, block, turn-based, war-game designed to replicate the key elements of the operational level of war. I estimate 20 minutes required to teach the rules of the game with the game itself requiring no more than an hour to complete the contest. The game is video recorded to be used for game analysis and aid in the following interview. The serious board game will not present participants with any potential violations of the Uniformed Code of Military Justice or criminal law. There is no intent for ethical dilemmas, nor will any classified material be contained in the survey.

The semi-structured interviews are conducted at a scheduled date after the conclusion of the game. Using the games as the catalyst of discussion, the research will ask participants about specific aspects of the game, inquiring on both deliberate thought processes and emotional states during the course of the game. I estimate no more than 45 minute to complete the semi-structured interviews. After the interview, the researcher will create a summary of the discussion and send it to the participant for approval. Only approved summaries will be used for analysis. Interviews are tape recorded to allow the researcher to focus on discussing the game with the participant. The semi-structured interview will not present.

Potential Risks/Discomfort

There are no known physical or mental risks in this study and none of the information contained in this questionnaire is personally sensitive. A minimal amount of Personally Identifiable Information will be included in the survey instrument and is used only to coordinate the game and interviews. All completed forms will be collected and remain locked in a safe when not in use. Analog notes taken by the researcher will also be stored in a safe. Digital information, the recorded game and interview tape, will remain on a personal computer with the files encrypted. For confidentiality, no information will be stored on a government computer, in government

offices, or uploaded to any cloud-based services. You may withdraw at any time and you may choose not to answer any questions you feel uncomfortable answering.

Potential Benefit

There are no direct benefits to you to and I will offer no compensation or incentives for your participation in this questionnaire. The results of this questionnaire will assist the researcher by shedding light on leadership at the operational level during large-scale ground combat operations. By aiding in this research, greater effort can be directed towards filling those gaps in doctrine, training, and US Army educational institutions. Documents with your name, such as this form, will never be stored together with your data.

Anonymity/Confidentiality

All data obtained about you will be for the purposes of conducting the questionnaire and will be considered privileged. You will not be identified in any presentation of the results. All data collected in this study is confidential and is coded so that your name is not associated with them. Additionally, the coded data will be made available to me as I conduct the analysis associated with this study. This form will be stored by the Combined Arms Center – Education Human Protections Administrator for three years. The Army Human Subjects Protection Office or a designated Department of Defense representative may review this form to ensure compliance with Department of Defense regulations.

Right to Withdraw

Participation in the survey, serious board game, and interviews is voluntary. You have the right to cease participating at any time without penalty. You have the right to decide to not answer questions when filling out the questionnaire or conducting the semi-structured interviews if you do not feel comfortable answering them or stop all together. If you withdraw at any point of the research, I will not use any data. A second consent form will be provided after the game to ensure continued voluntary participation for the final portion of the human subjects research. You will

suffer no penalties whatsoever from your withdrawal. I will be happy to answer any question that may arise about this study.

Contacts for Additional Assistance

Please direct your questions or comments about this interview to the researcher at 762-822-4132. If you have any questions or concerns about the conduct of this questionnaire or other aspects of the research, please contact the Command and General Staff College HPA at bobbie.j.murray6.civ@mail.mil.

Signatures

I have read the above description of the Quantitative Questionnaire regarding Decisionmaking at the Operational Level of War: a mixed method research approach using a qualitative literature review with a quantitative questionnaire distributed to human participants, and understand the conditions of my participation.

My signature indicates that I agree to participate in the study.

Participants printed

Name:_____

Participants signature: _____

Date:_____

Researcher's name: MAJ Aaron J Tucker

Researchers Signature:_____

Date:_____

Appendix F: Post-Game Consent Form

Introduction

The research method for this study is a mixed methods approach using a qualitative questionnaire, quantitative operational-level board game that have already been completed, and qualitative semi-structured interviews. A literature review covering adult education, decision making processes, and a review of the operational level of war informed the creation and structure of human research.

Purpose

You are invited to participate in a research study that is part of a thesis requirements at the School of Advanced Military Studies at Fort Leavenworth, Kansas. The purpose of the mixed method research approach is to provide baseline data that will allow the researcher to focus on the examination of leadership at the operational level of war and its relevance in today's operational environment. Specifically, research explores the interplay between experience, self-efficacy, and decision making in uncertain environments. As the proprietor of the study, will conduct data collection by the ways previously mentioned, maintaining total confidentiality of all participants. Once the data is collected, data analysis will be conducted to identify any relations between experience, self-efficacy, decision making, and leadership. For military personnel, I am only interested in US Army flag officers who are serving or have the potential to serve in key operational-level decision making billets. For civilian participants, I am only interested in those who have a relative amount of experience with serious board games and have never served in the military

Participation Requirements

I am asking you to continue your participation in a qualitative questionnaire, quantitative serious board game, and a qualitative semi-structured interview. The questionnaire covered questions concerning levels of confidence, previous work experiences, civil education, and military

education. The serious board game **was** novel, block game. The results of the game provide data required for pattern analysis and facilitates discussion during the semi-structured interviews. The semi-structured interviews are conducted at a scheduled date after the conclusion of the game. Using the games as the catalyst of discussion, the research will ask participants about specific aspects of the game, inquiring on both deliberate thought processes and emotional states during the course of the game. There is no deception during the interviews**.** I estimate no more than 45 minute to complete the semi-structured interviews. After the interview, the researcher will create a summary of the discussion and send it to the participant for approval. Only approved summaries will be used for analysis. Interviews are tape recorded to allow the researcher to focus on discussing the game with the participant. The semi-structured interview will not present

Potential Risks/Discomfort

There are no known physical or mental risks in this study and none of the information contained in this questionnaire is personally sensitive. A minimal amount of Personally Identifiable Information will be included in the survey instrument and is used only to coordinate the game and interviews. All completed forms will be collected and remain locked in a safe when not in use. Analog notes taken by the researcher will also be stored in a safe. Digital information, the recorded game and interview tape, will remain on a personal computer with the files encrypted. For confidentiality, no information will be stored on a government computer, in government offices, or uploaded to any cloud-based services. You may withdraw at any time and you may choose not to answer any questions you feel uncomfortable answering.

Potential Benefit

There are no direct benefits to you to and I will offer no compensation or incentives for your participation in this questionnaire. The results of this questionnaire will assist the researcher by shedding light on leadership and decision making at the operational level during large-scale ground combat operations. By aiding in this research, greater effort can be directed towards

filling those gaps in doctrine, training, and US Army education. Documents with your name, such as this form, will never be stored together with your data.

Anonymity/Confidentiality

All data obtained about you will be for the purposes of conducting the research and will be considered privileged. You will not be identified in any presentation of the results. All data collected in this study is confidential and is coded so that your name is not associated with them. Additionally, the coded data will be made available to me as I conduct the analysis associated with this study. This form will be stored by the Combined Arms Center – Education Human Protections Administrator for three years. The Army Human Subjects Protection Office or a designated Department of Defense representative may review this form to ensure compliance with Department of Defense regulations.

Right to Withdraw

Participation in the survey, serious board game, and interviews is voluntary. You have the right to cease participating at any time without penalty. You have the right to decide to not answer questions when filling out the questionnaire or conducting the semi-structured interviews if you do not feel comfortable answering them or stop all together. If you withdraw at any point of the research, I will not use any data. A second consent form will be provided after the game to ensure continued voluntary participation for the final portion of the human subjects research. You will suffer no penalties whatsoever from your withdrawal. I will be happy to answer any question that may arise about this study.

Contacts for Additional Assistance

Please direct your questions or comments about this interview to the researcher at (762)-822-4132. If you have any questions or concerns about the conduct of this questionnaire or other portions of the research project, please contact the Command and General Staff College HPA at bobbie.j.murray6@mail.mil.

Signatures

I have read the above description of the Quantitative Questionnaire regarding Decisionmaking at the Operational Level of War: a mixed method research approach using a qualitative literature review with a quantitative questionnaire distributed to human participants, and understand the conditions of my participation.

My signature indicates that I agree to participate in the study.

Participants printed

Name:_____

Participants signature: _____

Date:_____

Researcher's name: MAJ Aaron J Tucker

Researchers Signature:_____

Date:_____

Appendix G: In-Game Duty Log

Player Protocol Number		Opponent Protocol Number	
Initiative YES NO		Game Number	
Turn	I am confident that I know my opponent's plan and can forecast their moves.	I am confident that I can make timely decisions and task organize my forces	I am confident that I will win.