

EMPLOYING ABDUCTIVE REASONING TO ACHIEVE UNDERSTANDING

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
Conflict, Security, and Development

by

JOHN L. MORROW, MAJOR, U.S. ARMY
M.S., Pennsylvania State University, State College, Pennsylvania, 2010

Fort Leavenworth, Kansas
2015

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>		
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 13-06-2014		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) AUG 2013 – JUN 2014	
4. TITLE AND SUBTITLE Employing Abductive Reasoning to Achieve Understanding			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) MAJ John L. Morrow, U.S. Army			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301			8. PERFORMING ORG REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			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 The future operational environment is described as volatile, uncertain, complex, and ambiguous and composed of numerous dynamic and adaptive systems whose interactions produce unanticipated and disproportionate outcomes. To fulfill the Army's roles of preventing conflict, shaping the international environment, and winning the nation's wars in this future environment, military professionals must cultivate an ability to achieve understanding. According to the Army's cognitive hierarchy model for achieving understanding, military professionals must: (1) process data to form information; (2) analyze information to create knowledge; and (3) synthesize knowledge and apply judgment to develop an understanding. Yet, according to top military leaders, Army professionals are not doing this, which has contributed to poor strategic outcomes. To address this gap, Army mid-career Professional Military Education needs to cultivate among students the habit of abductive reasoning, which requires the integration of mature theories into military work. To test the utility of abductive reasoning, the Army's cognitive hierarchy model for achieving understanding is applied to five Command and General Staff Officers' Course student groups' PowerPoint presentations of the Syrian conflict: four completed by groups which do not explicitly employ abductive reasoning and one which does. While not conclusive, the results of this study suggest that the group employing abductive reasoning achieved an understanding of the complexities of the Syrian conflict while the other four groups did not.					
15. SUBJECT TERMS Abductive reasoning					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. PHONE NUMBER (include area code)
(U)	(U)	(U)	(U)	113	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: Major John L. Morrow

Thesis Title: Employing Abductive Reasoning to Achieve Understanding

Approved by:

_____, Thesis Committee Chair
LTC Celestino Perez, Jr., Ph.D.

_____, Member
Michelle A. Miller, Ph.D.

_____, Member
William H. Kautt, D.Phil., F.R.Hist.S.

Accepted this 24th day of February 2015 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

EMPLOYING ABDUCTIVE REASONING TO ACHIEVE UNDERSTANDING, by Major John L. Morrow, U.S. Army, 113 pages.

The future operational environment is described as volatile, uncertain, complex, and ambiguous and composed of numerous dynamic and adaptive systems whose interactions produce unanticipated and disproportionate outcomes. To fulfill the Army's roles of preventing conflict, shaping the international environment, and winning the nation's wars in this future environment, military professionals must cultivate an ability to achieve understanding. According to the Army's cognitive hierarchy model for achieving understanding, military professionals must: (1) process data to form information; (2) analyze information to create knowledge; and (3) synthesize knowledge and apply judgment to develop an understanding. Yet, according to top military leaders, Army professionals are not doing this, which has contributed to poor strategic outcomes. To address this gap, Army mid-career Professional Military Education needs to cultivate among students the habit of abductive reasoning, which requires the integration of mature theories into military work. To test the utility of abductive reasoning, the Army's cognitive hierarchy model for achieving understanding is applied to five Command and General Staff Officers' Course student groups' PowerPoint presentations of the Syrian conflict: four completed by groups which do not explicitly employ abductive reasoning and one which does. While not conclusive, the results of this study suggest that the group employing abductive reasoning achieved an understanding of the complexities of the Syrian conflict while the other four groups did not.

ACKNOWLEDGMENTS

First, I thank God for giving me the opportunity to serve in the finest Army in the world, and for giving me the talents and abilities to complete this study. Second, I thank my amazingly patient and strong wife, Melissa, and our two children, Madison and Joshua. Their support and prayers have encouraged and sustained me through this journey. Third, I thank my former Small Group Advisor, Dr. Michelle Miller for her recommendation and support for joining the Local Dynamics of War Scholars Program. Finally, I thank LTC Celestino Perez for accepting me into his life altering program. I have learned more in the past five months about the responsibilities of the Army professional than I did in my previous 16 years in the Army. Thank you all for believing in me and thank you for your guidance.

TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE	iii
ABSTRACT.....	iv
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS.....	vi
ACRONYMS.....	viii
ILLUSTRATIONS	ix
TABLES	x
CHAPTER 1 INTRODUCTION	1
Purpose and Proposed Approach to Improving Understanding.....	5
Findings and Implications.....	7
Overview.....	8
CHAPTER 2 LITERATURE REVIEW	9
The Human Domain.....	9
The Nature of an Operational Environment	10
The Army’s Cognitive Hierarchy Model for Achieving Understanding.....	17
Achieving an Understanding of an Operational Environment.....	22
Abductive Reasoning.....	25
Abductive Reasoning and the Military Professional	28
Conclusion	34
CHAPTER 3 METHODOLOGY	35
PowerPoint Presentations and the Military.....	36
CGSOC Student Groups Used in this Study.....	39
Examples of the Army’s Cognitive Hierarchy Model	43
Analyzing the Content of PowerPoint Presentations.....	45
Limitations	50
Conclusion	54

CHAPTER 4 ANALYSIS	56
CGSOC Student Groups' Presentations on the Syrian Conflict	56
Discussion of Assessment.....	83
Conclusion	89
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS.....	91
Recommendations.....	93
BIBLIOGRAPHY.....	96

ACRONYMS

ADRP	Army Doctrine Reference Publication
CGSOC	Command and General Staff Officer Course
JP	Joint Publication
LDW	Local Dynamics of War
PME	Professional Military Education
PMESII-PT	Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time

ILLUSTRATIONS

	Page
Figure 1. The Army's Cognitive Hierarchy Model for Achieving Understanding	18
Figure 2. Forms of Reasoning	28
Figure 3. Evaluation of Group 2's (Fall Elective) PowerPoint Slide.....	48
Figure 4. Evaluation of Group 5's (LDW) PowerPoint Slide	50
Figure 5. Example of a Slide which Conveys only Data and Information.....	53
Figure 6. Example of a Slide which Conveys Knowledge and Understanding	54
Figure 7. Group 4's (Common Core) Visual Model of the Syrian Conflict	70
Figure 8. Group 5's (LDW) Visual Model of the Syrian Conflict	75
Figure 9. Assessment of CGSOC Student Groups' Presentations	84
Figure 10. Combined Data/Information and Knowledge/Understanding	86

TABLES

	Page
Table 1. Characteristics of Several Types of Systems	14
Table 2. List of Groups Analyzed.....	40
Table 3. Definitions Used for Achieving Understanding	43
Table 4. Assessment of Group 1's (Spring Elective) PowerPoint Presentation	58
Table 5. Assessment of Group 2's (Fall Elective) PowerPoint Presentation.....	62
Table 6. Assessment of Group 3's (Satellite) PowerPoint Presentation.....	66
Table 7. Assessment of Group 4's (Common Core) PowerPoint Presentation	71
Table 8. Assessment of Group 5's (LDW) PowerPoint Presentation.....	78
Table 9. Assessment of Groups' PowerPoint Presentations	83

CHAPTER 1

INTRODUCTION

What they're dealing with is much more complex and much more nuanced than what we were trained to do when I was a captain. You have to understand not just what we call the military terrain . . . the high ground and low ground. It's about understanding the human terrain, really understanding it.

— General David Petraeus, “Scions of the Surge”

Twenty-first century military professionals conduct their expert work in operational environments that are increasingly volatile, uncertain, complex, and ambiguous.¹ Technology proliferation, population growth, urbanization, declining natural resources, globalization, climate change, and decreased stability created by the collapse of the Cold War bipolar power struggle, all interact in unpredictable ways to create conditions from which conflict can and will emerge.² Joint Publication (JP) 3-0, *Joint Operations*, states that “this environment is fluid, with continually changing alliances, partnerships, and new national and transnational threats constantly appearing and disappearing.”³ According to Major General Robert Brown, commanding general of the U.S. Army Maneuver Center of Excellence in 2011, “the current operational environment

¹Judith Stiehm, *The U.S. Army War College: Military Education in a Democracy* (Philadelphia: Temple University Press, 2002), 6.

²Harry R. Yarger, *Strategy and the National Security Professional: Strategic Thinking and Strategy Formulation in the 21st Century* (Westport, CT: Praeger Security International, 2008), 1.

³Joint Chiefs of Staff, Joint Publication 3-0, *Joint Operations* (Washington, DC: Government Printing Office, August 2011), I-2.

will continue to evolve, presenting ground forces in the future with an ever increasing challenge to defeat irregular and hybrid enemies.”⁴

These conditions have led one author to claim the character of war has changed from enemy-centric to population-centric, what General Rupert Smith calls a shift from “industrial war” to “war amongst the people.”⁵ If this is true, as assumed in this study, then the ends for which wars are fought have changed.⁶ Military victory is no longer the primary end state.⁷ Instead, the military’s primary purpose is to create the conditions in which strategic objectives are achieved. This idea is supported by The Army Vision which states that the Army exists to prevent conflict, help shape the international environment, and, when necessary, win decisively.⁸ Furthermore, according to Army doctrine, when Army forces focus on winning decisively, characterized by finding, fixing, closing with, and destroying an armed opponent, they must also address the “requirements of noncombatants” in the operational environment before, during, and after combat, if strategic objectives are to be achieved.⁹

⁴Robert B. Brown, “Movement and Maneuver: A Vision for the Future,” *Army* 61, no. 6 (June 2011): 61.

⁵Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (New York: Alfred A Knopf, 2007), 3.

⁶Charles T. Cleveland and Stuart L. Farris, “Toward Strategic Landpower,” *Army* 63, no. 7 (July 2013): 21.

⁷Toni Pfanner, “Interview with General Sir Rupert Smith,” *International Review of the Red Cross* 88, no 864 (2006): 719-727.

⁸Headquarters, Department of the Army, Army Doctrine Publication 1, *The Army Profession* (Washington, DC: Government Printing Office, September 2012), 1-5 to 1-7.

⁹*Ibid.*, 1-7.

“Industrial war” is characterized by the desire “to win a trial of strength and thereby break the will of your opponent, to finally dictate the result, the political outcome you wished to achieve.”¹⁰ “War among the people,” is characterized by the desire to “change the intentions or capture the will of [the] opponent and the people amongst which [military professionals] operate, to win the clash of wills and thereby win the trial of strength.”¹¹ War among the people demands a different type of expertise than industrial war. In industrial war, military professionals must develop an understanding of the “military terrain” which includes the enemy, terrain, weather, tactics, and weapon systems, and their effects on the employment of friendly combat power.¹² In war among the people, military professionals must develop an understanding of the military terrain and the human domain (also called the human terrain), defined as “the totality of the physical, cultural, and social environments that influence human behavior to the extent that success of any military strategy, operation, or tactical action depends on the application of unique capabilities that are designed to fight and win population-centric conflicts.”¹³

Although military professionals excel at developing an understanding of the military terrain, one of the hard lessons the Army has learned from the wars in Afghanistan and Iraq is that military professionals struggle to develop an understanding

¹⁰Headquarters, Department of the Army, Army Doctrine Publication 1, 1-7.

¹¹Pfanner, “Interview with General Sir Rupert Smith,” 719.

¹²Babak Dehghanpisheh, “Scions of the Surge,” *Newsweek*, 15 March 2008, <http://www.newsweek.com/how-iraq-war-changes-us-officers-83711> (accessed 22 July 2014).

¹³Cleveland and Farris, “Toward Strategic Landpower,” 21.

of the human domain; in other words they struggle to understand the operational environment.¹⁴ Reflecting on his time in Iraq, General Raymond Odierno states that “when we went into Iraq in 2003, we did everything that we wanted to do. We very quickly removed the regime. We gained control of the population. [However], we had no idea or clue of the societal devastation that had gone on inside of Iraq and what would push back on us. We didn’t even think about it until we got in there. So we can’t allow that to happen again.”¹⁵ General Martin Dempsey describes his struggle to understand the human domain by stating:

I commanded the 1st Armored Division in 2003/2004, in Baghdad. As you know the Division’s mission in the beginning of OIF, was to go from Kuwait to Baghdad, movement to contact, hasty attack. A very understandable problem. METT-T, mission, enemy terrain, troops available, and time. I know how to figure that out; it was me against them and I knew who “them” were, and I know where the ground was, I knew where I was, and I could make this kind of mathematical – I could lay down this geometric formation and move it to Baghdad. Having arrived in Baghdad, the mission of the Division was changed to establish a safe and secure environment. In a city of 7 million, with huge sectarian issues, separated both physically and psychologically by a river. So, this old, at that time 55-year-old or so, Irish-Catholic from Bayonne, New Jersey, was perplexed.¹⁶

¹⁴Peter W. Chiarelli and Patrick R. Michaelis, “Winning the Peace: The Requirements for Full-Spectrum Operations,” *Military Review* 85, no. 4 (July-August 2005): 4-17.

¹⁵Raymond T. Odierno, “Amid Tighter Budgets, U.S. Army, Rebalancing and Refocusing: A Conversation with Raymond T. Odierno,” interview by James Sciutto, Council on Foreign Relations, 11 February 2014, <http://www.cfr.org/united-states/amid-tighter-budgets-us-army-rebalancing-refocusing/p32373> (accessed 25 April 2014).

¹⁶Martin E. Dempsey, “Introductory Remarks,” in *War Termination: The Proceedings of the War Termination Conference United States Military Academy West Point*, ed. Matthew Moten (Fort Leavenworth, KS: Combat Studies Institute Press, 2010), 4.

Purpose and Proposed Approach to Improving Understanding

Reflecting on the U.S. military's performance in the recent past, General Odierno, General James F. Amos, and Admiral William H. McRaven state, "time and again, the U.S. has undertaken to engage in conflict without fully considering the physical, cultural, and social environments that comprise what some have called the 'human domain.' One has only to examine our military interventions over the last 50 years in Vietnam, Bosnia, and Kosovo, Somalia, Iraq, and Afghanistan, to see the evidence and costs of this oversight."¹⁷ Given this performance, the foci of this study are; (1) the Army's cognitive hierarchy model for achieving understanding; and (2) the Army's process for achieving an understanding of the operational environment which includes the human domain. This thesis seeks to answer the question of how Army mid-career Professional Military Education (PME) can more fully prepare military professionals to develop an understanding of the operational environment.

Abductive reasoning is proffered as an approach which can help military professionals improve their understanding of the operational environment. Ian Shapiro, Sterling Professor of Political Science and Henry R. Luce Director for The Whitney and Betty MacMillian Center for International and Area Studies at Yale University, defines abductive reasoning as "reasoning on the basis of mature theories from observed effects to unobservable causes . . . as a way of generating knowledge in which theory plays a

¹⁷Raymon T. Odierno, James F. Amos, and William H. McRaven, *Strategic Landpower: Winning the Clash of Wills White Paper*, 2013, <http://www.tradoc.army.mil/FrontPageContent/Docs/Strategic%20Landpower%20White%20Paper.pdf> (accessed 20 May 2014), 2.

vital role.”¹⁸ Although not explicitly named in doctrine, abductive reasoning is not a completely new approach to developing an understanding of an operational environment.

For example, Army Doctrine Reference Publication (ADRP) 6-0, *Mission Command*, states military professionals use “experience, training, and study to inform their decisions,” and “individuals learn through study, experience, practice, and human interaction, as they develop their expertise and skilled judgment.”¹⁹ The study mentioned in this ADRP could be interpreted as learning gained through examination of scholarly literature (e.g., theories about the causes of conflict, conflict resolution, and alliance formation), stakeholder perspectives, and expert opinion, that can guide military professionals in the execution of their expert work. However, military professionals are not traditionally taught to examine these type of theories. Instead, they are taught to collect information on operational variables (political, military, economic, social, information, infrastructure, physical environment, and time), mission variables (mission, enemy, terrain and weather, troops and support available, time available, and civil considerations), and civil considerations from the mission variables (areas, structures, capabilities, organizations, people, and events).²⁰

¹⁸Ian Shapiro, *Flight from Reality in the Human Sciences* (Princeton, NJ: Princeton University Press, 2005), 39.

¹⁹Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington, DC: Government Printing Office, May 2012), 2-7.

²⁰Headquarters, Department of the Army, Army Doctrine Reference Publication 5-0, *The Operations Process* (Washington, DC: Government Printing Office, May 2012), 1-7 to 1-9; Headquarters, Department of the Army, Field Manual 2-01.3/MCRP 2-3 A, *Intelligence Preparation of the Battlefield/Battlespace* (Washington, DC: Government Printing Office, October 2009), 3-15 to 3-20.

This information usually is obtained from sources like the Central Intelligence Agency's The World Factbook which "provides information on the history, people, government, economy, geography, communications, transportation, military, and other transnational issues for 267 world entities."²¹ Although this material is credible and good for providing a familiarization of an operational environment, it is not the basis on which to make decisions as it is only information, not knowledge or understanding.²² To achieve understanding, information must be analyzed to create knowledge, and knowledge must be synthesized and have judgment applied to it.²³

Findings and Implications

To test the utility of abductive reasoning, this study assesses PowerPoint presentations of the Syrian conflict created by five Command and General Staff Officers' Course (CGSOC) student groups; the first four presented in 2013 and the last presented in 2014 (see Table 2). Four of the groups do not explicitly use abductive reasoning to develop their understanding of the operational environment while one group does. Results of this assessment suggest, though not conclusively, that a group which uses abductive reasoning to inform a systems perspective will achieve a higher percentage of knowledge and understanding than a group which does not explicitly do so. If the findings are valid, then mid-career PME should consider using the Army's cognitive

²¹Central Intelligence Agency, "The World Factbook," last modified 6 June 2014, <https://www.cia.gov/library/publications/the-world-factbook/> (accessed 29 July 2014).

²²Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

²³Ibid.

hierarchy model to evaluate students' PowerPoint presentations to help not only evaluators, making assessments more objective, but also students by teaching them what the Army expects of its leaders.

Overview

To answer the research question, this thesis is organized into five chapters. Chapter 2 is a literature review of the human domain, the operational environment, the Army's cognitive hierarchy model for achieving understanding (including scholarly perspectives on the four levels of this model), the Army's approach to achieving an understanding of an operational environment, and abductive reasoning. Chapter 3 describes the methodology used in this study to evaluate the CGSOC student groups' presentations of the Syrian conflict. Applying the Army's cognitive hierarchy model, each group's presentation is evaluated to determine the amount of material at each level of the model (i.e., data, information, knowledge, or understanding).²⁴ Chapter 4 presents and discusses the results of this evaluation for each group. Chapter 5 provides concluding remarks and recommendations.

²⁴Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

CHAPTER 2

LITERATURE REVIEW

Winning battles and engagements is important but alone is usually insufficient to produce lasting change in the conditions that spawned conflict. Our effectiveness depends on our ability to manage populations and civilian authorities as much as it does on technical competence employing equipment. Managing populations before, during, and after all phases of the campaign normally determines its success or failure.

— Headquarters, Department of the Army,
Army Doctrine Publication 1, *The Army Profession*

The Human Domain

War is a clash of wills between armed opponents; it is inherently a human endeavor.²⁵ Although this should be understood by military professionals, “this fundamental premise often has not received the central emphasis that it should in U.S. military deliberation. War is inarguably the toughest of physical challenges, and [military professionals] therefore tend to focus on the clash and lose sight of the will.”²⁶ The types of future conflict the Army is most likely to encounter has been described as war among the people where, in contrast to the traditional paradigm of war, the military objective is the population itself.²⁷

The human domain is defined by Lieutenant General Charles Cleveland, commander of U.S. Army Special Operations Command, as “the totality of the physical, cultural, and social environments that influence human behavior to the extent that success

²⁵Odierno, Amos, and McRaven, *Strategic Landpower*, 2.

²⁶*Ibid.*

²⁷Cleveland and Farris, “Toward Strategic Landpower,” 21-22.

of any military strategy, operation, or tactical action depends on the application of unique capabilities that are designed to fight and win population-centric conflicts.”²⁸ According to Lieutenant General Cleveland, this paradigm requires military forces to be able to not only destroy but also “to first understand the population within the context of the operational environment and then take meaningful action to effectively influence human behavior toward achieving the desired outcome.”²⁹

The Nature of an Operational Environment

JP 3-0 defines an operational environment as “the composite of the conditions, circumstances, and influences that affect employment of capabilities and bear on the decision of the commander.”³⁰ An operational environment is not just an isolated set of interacting conditions that exists within a specific area of operations.³¹ Rather, it includes the conditions, relationships, threats, trends, interactions, and opportunities of both the internal and external contexts.³² This environment is aptly described as a context in which “the threats are both diffuse and uncertain, where conflict is inherent yet unpredictable...In short, an environment marked by volatility, uncertainty, complexity,

²⁸Cleveland and Farris, “Toward Strategic Landpower,” 21.

²⁹Ibid., 21-22.

³⁰Joint Chiefs of Staff, Joint Publication 3-0, IV-1.

³¹Headquarters, Department of the Army, Army Doctrine Reference Publication 3-0, *Unified Land Operations* (Washington, DC: Government Printing Office, May 2012), 1-1.

³²Harry R. Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy* (Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, February 2006), 17.

and ambiguity (VUCA).”³³ Each of these characteristics indicates that the operational environment is in a constant state of instability, creating conditions which are favorable for conflict.³⁴ The role of military professionals in an era of persistent conflict is to understand and accurately describe the environment and then successfully intervene to prevent conflict, shape the environment, and, when necessary, win decisively.³⁵ This sentiment is captured by former Chairman of the Joint Chiefs of Staff, General John Shalikashvili, stating “the military has an important role in engagement—helping to shape the international environment in appropriate ways to bring about a more peaceful and stable world.”³⁶

A volatile operational environment is one that is subject to rapid and explosive changes, typically accompanied by violence.³⁷ Uncertainty indicates that this environment is not predictable with any certainty. This is due to the continual evolution that takes place when learning and adapting human beings interact within an operational environment, thereby changing that environment.³⁸ Complexity means that the

³³Roderick R. Magee II, ed., *Strategic Leadership Primer* (Carlisle Barracks, PA: U.S. Army War College, 1998), 1.

³⁴Headquarters, Department of the Army, Army Doctrine Reference Publication 3-0, 1-1.

³⁵Headquarters, Department of the Army, Army Doctrine Publication 1, 1-5.

³⁶John M. Shalikashvili, *National Military Strategy of the United States of America: Redefining America’s Military Leadership* (Washington, DC: Joint Chiefs of Staff, 1997), cover letter.

³⁷Yarger, *Strategic Theory for the 21st Century*, 18.

³⁸Headquarters, Department of the Army, Army Doctrine Reference Publication 3-0, 1-2.

environment is dynamic and unpredictable because the environment is composed of numerous systems with numerous parts that enjoy a significant amount of freedom of action.³⁹ The more freedom, the greater the dynamics. Interactions among the systems often produces disproportionate outcomes and unanticipated emergent behavior.⁴⁰ Finally, these environments are ambiguous which means that they can be interpreted from numerous perspectives with differing conclusions, each suggesting “a variety of equally attractive solutions, some of which will prove to be good and others bad.”⁴¹

JP 3-0 states “one way to think of the operational environment is as a set of complex and constantly interacting . . . systems.”⁴² A system is a “functionally, physically, and/or behaviorally related group of regularly interacting or independent elements forming a unified whole.”⁴³ JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment*, states that a system “consists of interconnected nodes and links . . . Nodes represent the tangible elements within a system that can be targeted for action, such as people, places, or things . . . Links are the behavioral or functional relationships between nodes, such as the command or supervisory arrangements that connect a superior to a subordinate; the relationship of a vehicle to a fuel source; and the

³⁹Paul K. Van Riper, “An Introduction to System Theory and Decision-Making,” 2010, 1, quoted in Joint Chiefs of Staff, *Planner’s Handbook for Operational Design Version 1.0* (Suffolk, VA: Joint Staff, J-7, Joint and Coalition Warfighting, 7 October 2011), II-5.

⁴⁰Ibid.

⁴¹Yarger, *Strategic Theory for the 21st Century*, 18.

⁴²Joint Chiefs of Staff, Joint Publication 3-0, IV-4.

⁴³Ibid.

ideology that connects a propagandist to a group of terrorists.”⁴⁴ Once identified, nodes and links help military professionals visualize and describe the various systems existing and interacting internally and externally to an operational environment.⁴⁵

Although not discussed in Army or joint doctrine, a description of the different types of systems is important to understanding an operational environment. According to the Joint Chiefs of Staff *Planner’s Handbook for Operational Design*, there are closed and open systems, structurally complex and interactively complex systems, and determined and adaptive systems.⁴⁶ Table 1 summarizes the characteristics of each type of system. Systems within an operational environment are typically classified as open, interactively complex, and adaptive, also known as complex adaptive systems.⁴⁷

⁴⁴Joint Chiefs of Staff, Joint Publication 2-01.3, *Joint Intelligenc Preparation of the Operational Environment* (Washington, DC: Government Printing Office, June 2009), II-46.

⁴⁵Ibid.

⁴⁶Joint Chiefs of Staff, *Planner’s Handbook for Operational Design*, II-4.

⁴⁷Ibid.

Table 1. Characteristics of Several Types of Systems

Type of System	Definition
Closed	Can be easily understood and actions taken regarding those systems may be predicable with reasonable certainty. An example includes electrical grids or lines of communication. ⁴⁸
Open	Involve economic, political and social interaction. They are dominated by humans, who are both adaptable and unpredictable. Thus, actions taken regarding those systems cannot be predicted with any degree of certainty. ⁴⁹
Structurally complex	These are systems with increasingly more parts and orderly arrangement of those parts. They produce rigid, lockstep, and generally predictable behavior. Many modern machines possess this characteristic; they have numerous parts arranged in a specific manner, but they operate in only one way or they do not operate at all. Often we can understand structurally complex systems better by studying their parts separately. They are systems where the sum equals the parts. Structurally complex systems are also known as linear systems. ⁵⁰
Interactively complex	These systems are dynamic and unpredictable because they lack a fixed structure and enjoy a significant freedom of action among the parts. The more freedom of action, the greater the dynamics of the system. These systems create multifaceted, rich, challenging, and potentially volatile behavior. Actions within the system often produce disproportionate outcomes. Even interactive systems with only a few parts can exhibit surprisingly rich and novel behavior. The interaction among the parts and the unanticipated emergent behavior is what makes these systems unique. Little benefit is gained by separating the parts and studying them in isolation. In the act of separation, the system loses its coherence and the parts lose their meaning. These systems are not additive; indeed they are greater than the sum of their parts. These systems are also known as non-linear systems. ⁵¹
Determined	Can be identified by the linear relationship between the inputs and outputs of the system. Determined systems are comprised of components that must also behave in a linear, predictable manner. Examples include automobiles, airplanes, and most modern machines. ⁵²
Adaptive	Identified by the non-linear and often unpredictable relationship between inputs and system responses. Adaptive systems are comprised of “agents” (vice components). Identical inputs to an adaptive system may produce different responses each time they are introduced, making the adaptive system difficult to predict with any precision. Many human organizations behave as adaptive systems, especially when there is little centralized control and the behavior of the members (the system’s agents) adheres to a common set of rules. ⁵³

Source: Created by author using information from Joint Chiefs of Staff, *Planner’s Handbook for Operational Design Version 1.0* (Suffolk, VA: Joint Staff, J-7, Joint and Coalition Warfighting, 7 October 2011), II-5, II-6.

⁴⁸Joint Chiefs of Staff, *Planner’s Handbook for Operational Design*, II-5.

⁴⁹Ibid.

⁵⁰Van Riper, II-5.

⁵¹Ibid.

⁵²Ibid., II-6.

⁵³Ibid.

Complex adaptive systems are not additive meaning that “the system taken as a whole exhibits properties and behaviors that are different from those of the sum of the parts.”⁵⁴ This is why there is little benefit in separating the parts and studying them in isolation: “in the act of separation, the system loses its coherence and the parts lose their meaning.”⁵⁵ Complexity is found in both man-made and natural systems and the level of complexity is dependent on the environment, the character of the systems, and the nature of the interaction between them.⁵⁶ Additionally, in complex adaptive systems, “the numerous elements continuously interact and spontaneously self-organize and adapt for survival in an increasingly more elaborate and sophisticated structures over time.”⁵⁷

Complex adaptive systems are non-linear and are composed of agents versus components where inputs may produce different responses each and every time they are introduced, making prediction difficult.⁵⁸ The different parts of the system are linked, where a change in one part of the system causes a change in other parts through positive and negative feedback mechanisms.⁵⁹ These characteristics are captured in ADRP 3-0, *Unified Land Operations*, stating “as people take action in an operational environment, they change that environment. Other variables may also change in an operational

⁵⁴Yarger, *Strategic Theory for the 21st Century*, 20.

⁵⁵Van Riper, II-5.

⁵⁶Yarger, *Strategic Theory for the 21st Century*, 21.

⁵⁷Ibid.

⁵⁸Headquarters, Department of the Army, Army Doctrine Reference Publication 3-0, 1-2.

⁵⁹Yarger, *Strategic Theory for the 21st Century*, 21.

environment. Some changes are anticipated while others are not. Some changes are immediate and apparent while other changes evolve over time or are extremely difficult to detect.”⁶⁰ Despite the difficulty associated with detecting and understanding changes within complex adaptive systems, military professionals are expected and responsible to achieve understanding.⁶¹

The approach used to understand these types of systems is of great importance. If military professionals approach the operational environment with a methodology that is ill-suited to developing an understanding of the complexity inherent in social systems, wrong interpretations will be given and consequently wrong solutions will be proposed.⁶² Wrong solutions lead to wrong or mismatched intervention, exacerbating already volatile situations. Recognizing this, General Dempsey states “the other interesting thing about strategy . . . is whether it’s best to define an end state and then deliberately plot a series of actions to achieve that end state . . . or whether the world in which we live today actually is one where, kind of like the Heisenberg principle in physics, where you should touch it and see what happens.”⁶³ His point is that perhaps the Army’s traditional way of thinking about systems in the operational environment is not effective for successful intervention.

⁶⁰Headquarters, Department of the Army, Army Doctrine Reference Publication 3-0, 1-2.

⁶¹Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁶²Blair S. Williams, “Heuristics and Biases in Military Decision Making,” *Military Review* 90, no. 5 (September-October 2010): 40-52.

⁶³Ryan Evans and Jason Fritz, “A Conversation with the Chairman: General Martin E. Dempsey,” *War on the Rocks*, 25 February 2014, <http://warontherocks.com/2014/02/a-conversation-with-the-chairman-general-martin-e-dempsey/> (accessed 31 July 2014).

To highlight this point, it is necessary to examine the Army's cognitive hierarchy model for achieving understanding and then discuss the Army's traditional approach for achieving an understanding of an operational environment.

The Army's Cognitive Hierarchy Model for Achieving Understanding

To successfully intervene in operational environments composed of complex adaptive systems, military professionals need to make accurate and timely decisions.⁶⁴ This requires knowing when, if, where, and what to decide, and understanding the consequences of those decisions. Military professionals require knowledge and understanding to make sound decisions, develop meaningful plans, and assess the effectiveness of operations.⁶⁵ To gain knowledge and understanding, humans must assign meaning to data and information. The Army's cognitive hierarchy model defines four different levels of meaning. The military professional's task is to transform data and information into knowledge and understanding by adding progressively more meaning at each level of the model.⁶⁶

The Army's cognitive hierarchy model has four levels: data, information, knowledge, and understanding (see figure 1). ADRP 6-0 characterizes data as consisting of "unprocessed signals communicated between any nodes in an information system. It includes signals sensed from the environment, detected by a collector of any kind

⁶⁴Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁶⁵Ibid.

⁶⁶Headquarters, Department of the Army, Field Manual 6-0, *Mission Command: Command and Control of Army Forces* (Washington, DC: Government Printing Office, August 2003), B-0.

(human, mechanical, or electronic). However, to make data useful, people must process data into information.⁶⁷ According to Russell L. Ackoff, a systems theorist credited with the development of this cognitive hierarchy, data are the lowest level of the cognitive hierarchy and are the products of observation.⁶⁸ Jennifer Rowley, Professor of Marketing and Information Management at the Bangor Business School, adds that data is raw and has no significance except for its existence because it lacks context and interpretation.⁶⁹ She continues by saying, “data are discrete, objective facts or observations, which are unorganized and unprocessed, and do not convey any specific meaning.”⁷⁰

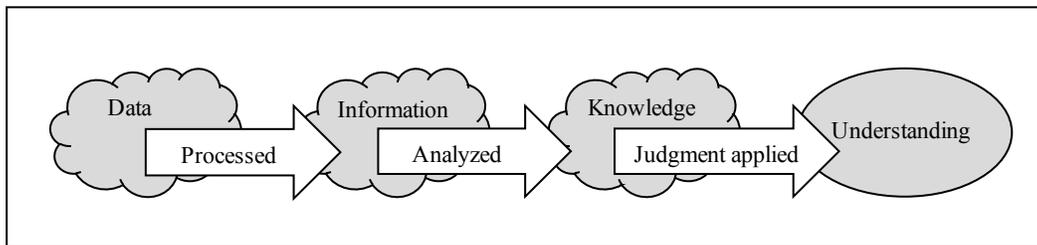


Figure 1. The Army’s Cognitive Hierarchy Model for Achieving Understanding

Source: Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington, DC: Government Printing Office, May 2012), 2-7.

⁶⁷Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁶⁸Russell L. Ackoff, “From Data to Wisdom,” *Journal of Applied Systems Analysis* 16 (1989): 3-9.

⁶⁹Jennifer Rowley, “The Wisdom Hierarchy: Representations of the DIKW Hierarchy,” *Journal of Information Science* 33, no. 2 (2007): 163-180.

⁷⁰*Ibid.*

The next level of the cognitive hierarchy is information. Information is the meaning a human assigns to data by providing context.⁷¹ According to Ackoff, information is data that has been processed to provide meaning and typically answers the questions of who, what, when, and where.⁷² Field Manual 6-0, *Mission Command: Command and Control of Army Forces*, states “processing includes filtering, fusing, formatting, organizing, collating, correlating, plotting, translating, categorizing, and arranging.”⁷³ According to Keri E. Pearlson and Carol S. Saunders, authors of *Managing and Using Information Systems: A Strategic Approach*, processing data requires a decision about the unit of analysis to be used in organizing data (e.g., dates, dollars, or population).⁷⁴ Pearlson and Saunders state “deciding on the appropriate unit of analysis involves interpreting the context of the data and summarizing them into a more condensed form.”⁷⁵

ADRP 6-0 states “information alone rarely provides an adequate basis for deciding and acting. Effective mission command requires further developing information into knowledge so commanders can achieve understanding.”⁷⁶ Knowledge is defined as “information analyzed to provide meaning and value, or evaluated as to implications for

⁷¹Rowley, 163-180.

⁷²Ackoff, 3-9.

⁷³Headquarters, Department of the Army, Field Manual 6-0, B-1.

⁷⁴Keri E. Pearlson and Carol S. Saunders, *Managing and Using Information Systems: A Strategic Approach*, 4th ed. (Hoboken, NJ: John Wiley and Sons, 2010), 349.

⁷⁵Ibid.

⁷⁶Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

the operation.”⁷⁷ Knowledge typically answers the question of how.⁷⁸ Other scholars have defined knowledge as “the combination of data and information, to which is added expert opinion, skills and experience, to result in a valuable asset which can be used to aid decision making.”⁷⁹ The analysis used to create knowledge makes it “richer and deeper than information and more valuable because someone has thought deeply about that information.”⁸⁰ An important distinction between knowledge and information is that individual cognition and critical thinking are required to create knowledge.⁸¹ Individual cognition is “the act of learning, of integrating from various pieces of information.”⁸² Critical thinking is “a deliberate process of thought whose purpose is to discern truth in situations where direct observation is insufficient, impossible, or impractical.”⁸³

The fourth and highest level in the Army’s cognitive hierarchy model is understanding. ADRP 6-0 defines understanding as “knowledge that has been synthesized and had judgment applied to it to comprehend the situation’s inner

⁷⁷Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁷⁸Ackoff, “From Data to Wisdom,” 3-9.

⁷⁹European Committee for Standardization, *European Guide to Good Practice in Knowledge Management: Part 1: Knowledge Management Framework* (Brussels: CEN, March 2004), http://enil.ceris.cnr.it/Basili/EnIL/gateway/europe/CEN_KM.htm, (accessed 23 July 2014), 6.

⁸⁰Ibid.

⁸¹Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁸²Headquarters, Department of the Army, Field Manual 6-0, B-1.

⁸³Headquarters, Department of the Army, Field Manual 5-0, 1-6.

relationships.”⁸⁴ Understanding explains the why of observed phenomena in a situation.⁸⁵ According to Field Manual 6-0, when military professionals achieve understanding, they are able to see patterns emerge from events taking place in the operational environment. Additionally, they are able to anticipate the consequences of both friendly and enemy actions.⁸⁶ JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment*, states “understanding the operational environment is fundamental to identifying the conditions required to achieve stated objectives; avoiding the effects that may hinder mission accomplishment (undesired effects); and assessing the impact of friendly, adversary, and other actors, as well as the local populace, on the commander’s CONOPS [concept of operations] and progress toward attaining the military end state.”⁸⁷ According to Bellinger et al., understanding is “an interpolative and probabilistic process. It is cognitive and analytical. It is the process by which I can take knowledge and synthesize new knowledge from previously held knowledge.”⁸⁸

Comprehending the Army’s cognitive hierarchy model to achieving understanding enables military professionals to realize the process the Army expects its members to use when making decisions, developing plans, and directing the actions of

⁸⁴Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

⁸⁵Ackoff, 3-9.

⁸⁶Headquarters, Department of the Army, Field Manual 6-0, B2.

⁸⁷Joint Chiefs of Staff, Joint Publication 2-01.3, I-2.

⁸⁸Gene Bellinger, Durval Castro, and Anthony Mills, “Data, Information, Knowledge, and Wisdom,” *Systems Thinking*, 2004, www.systems-thinking.org/dikw/dikw.htm (accessed 10 June 2014), 1.

the force. Yet this process does not identify what type of information or knowledge military professionals should gather and synthesize respectively. However, joint and Army doctrine do state elsewhere that operational and mission variables as well as civil considerations should be used. In the next section, these variables and conditions will be described.

Achieving an Understanding of an Operational Environment

ADP 3-0, *Unified Land Operations*, states “Army leaders plan, prepare, execute, and assess operations by analyzing the operational environment in terms of the operational variables and mission variables.”⁸⁹ Operational variables include the political, military, economic, social, information, infrastructure, physical environment, and time (known by the acronym PMESII-PT) dimensions of an area to which soldiers are deployed. The mission variables include the mission, enemy, terrain and weather, troops and support available, time available, and civil considerations (known by the acronym METT-TC).⁹⁰ Civil considerations are defined as “the influence of manmade infrastructure, civilian institutions, and the attitudes and activities of the civilian leaders, populations, and organizations within an area of operations on the conduct of military operations.”⁹¹ Civil considerations include areas, structures, capabilities, organizations,

⁸⁹Headquarters, Department of the Army, Army Doctrine Publication 3-0, 2.

⁹⁰Headquarters, Department of the Army, Field Manual 2-01.3, Change 2, *Intelligence Preparation of the Battlefield/Battlespace* (Washington, DC: Government Printing Office, 8 December 2010), 1-9 to 1-10.

⁹¹Headquarters, Department of the Army, Field Manual 6-0, B-8.

people, and events (known by the acronym ASCOPE).⁹² The interactions between operational and mission variables and civil considerations describe the operational environment.⁹³

In a Training and Doctrine Command G-2 publication entitled *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*, PMESII-PT is referred to as the Operational Environment Assessment Framework and is described as being used to “gain a holistic understanding of one specific operational environment . . . [and used for] . . . thoroughly and systematically analyzing and understanding any potential operational environment and all the challenges and opportunities inherent in it.”⁹⁴ Additionally, it says “the PMESII-PT variables are fundamental to the development of a comprehensive understanding of the operational environment for planning and decision-making at any level, in any situation.”⁹⁵ Yet, how should these variables be analyzed?

Field Manual 3-0, *Operations*, suggests determining the relationship between the variables is key to achieving understanding, stating understanding is “the product of applying analysis and judgment to relevant information to determine the relationships

⁹²Headquarters, Department of the Army, Field Manual 2-01.3, 3-15 to 3-20.

⁹³Headquarters, Department of the Army, Army Doctrine Publication 3-0, 2.

⁹⁴U.S. Army Training and Doctrine Command G2, *Operational Environments to 2028: The Strategic Environment for Unified Land Operations* (Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, August 2012), 11, 54.

⁹⁵*Ibid.*, 54.

among the mission variables to facilitate decisionmaking.”⁹⁶ However, Army doctrine does not explain how to determine the relationships. This guidance is found in joint doctrine. The methodology described in JP 3-0 is a network analysis and consists of identifying relevant nodes, which include systems and subsystems, determining and analyzing the relationships (links) between the nodes, and then identifying key nodes.⁹⁷

Due to the complex nature of systems present in the operational environment, both Army and joint doctrine recommend a graphic representation be used to depict the relationships among the numerous nodes present within the systems.⁹⁸ JP 2-01.3 suggests using circles that are color coded to represent nodes that are associated with a specific system and varied in size to represent its relative centrality.⁹⁹ Links should be represented by lines between the nodes. Solid lines depict known relationships while dashed lines portray suspected relationships. Arrows can be used to indicate the nature of the relationship, depicting the direction of influence between nodes.¹⁰⁰

Thus far, this chapter has presented both the Army’s approach of using operational and mission variables as well as civil considerations, and the joint approach of using a systems perspective as a means to gain knowledge and achieve understanding of complex adaptive systems. According to the Army’s cognitive hierarchy model,

⁹⁶Headquarters, Department of the Army, Field Manual 3-0, Change 1, *Operations* (Washington, DC: Government Printing Office, February 2011), 6-13.

⁹⁷Joint Chiefs of Staff, Joint Publication 2-01.3, II-50.

⁹⁸Headquarters, Department of the Army, Army Doctrine Reference Publication 5-0, 2-5.

⁹⁹Joint Chiefs of Staff, Joint Publication 2-01.3, II-50.

¹⁰⁰*Ibid.*

creating knowledge is “ultimately . . . the result of individual cognition . . . [learned] . . . through study, experience, practice, and human interaction, as [military professionals] develop their expertise and skilled judgment.”¹⁰¹ Similarly, understanding is achieved by applying judgment to synthesized knowledge that is used to make sound and sensible decisions and is based on experience, study, training, and critical and creative thinking.¹⁰² Army professionals use judgment “to assess information, situations, or circumstances shrewdly and to draw feasible conclusions.”¹⁰³ Yet, neither joint nor Army doctrine explains what type of studies should be used to gain knowledge and understanding. Abductive reasoning, which uses mature theories to develop new knowledge, is proffered as a method of gaining knowledge and achieving understanding.¹⁰⁴

Abductive Reasoning

Abductive reasoning is the means by which humans have “learned to solve problems and generate knowledge in their everyday lives.”¹⁰⁵ Charles S. Peirce, credited with categorizing abduction as a mode of logical reasoning, asserts abduction is the only knowledge-generating method of inference, compared to induction and deduction. Peirce defines induction as “that mode of reasoning which adopts a conclusion as approximate,

¹⁰¹Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

¹⁰²Ibid., 2-9.

¹⁰³Ibid.

¹⁰⁴Shapiro, *The Flight from Reality*, 39.

¹⁰⁵Jörg Friedrichs and Friedrich Kratochwil, “On Acting and Knowing: How Pragmatism Can Advance International Relations Research and Methodology,” *International Organization* 63, no. 4 (2009): 710.

because it results from a method of inference which must generally lead to the truth in the long run. For example, a ship enters a port laden with coffee. I go aboard and sample the coffee . . . I conclude by *induction* that the whole cargo has approximately the same value per bean as the hundred beans of my sample.”¹⁰⁶

Peirce states that deduction “is that mode of reasoning which examines the state of things asserted in the premises, forms a diagram of the state of things, perceives in the parts of that diagram relations not explicitly mentioned in the premises, satisfies itself by mental experiments upon the diagram that these relations would always subsist, or at least would do so in a certain proportion of cases, and concludes their necessary, or probable, truth.”¹⁰⁷ Finally, Peirce defines abductive reasoning as “the process of forming an explanatory hypothesis. It is the only logical operation which introduces any new idea; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis. Deduction proves that something must be; induction shows that something actually is operative; abduction merely suggests that something may be.”¹⁰⁸ Additionally, Peirce states abduction “consists in studying facts and devising a theory to explain them. Its only justification is that if we are ever to understand things at all, it must be in that way.”¹⁰⁹

¹⁰⁶Charles S. Peirce, *Collected Papers of Charles Sanders Peirce*, vols. 1, 2, 3, 4, 5, and 6, ed. Charles Hartshorne and Paul Weiss (Cambridge, MA: Harvard University Press, 1960), 28.

¹⁰⁷Ibid.

¹⁰⁸Charles S. Peirce, *Collected Papers of Charles Sanders Peirce*, vols. 7 and 8, ed. Arthur W. Burks (Cambridge, MA: Belknap Press, 1958), 106.

¹⁰⁹Peirce, *Collected Papers of Charles Sanders Peirce*, vols. 7 and 8, 90.

Demonstrating how each mode of reasoning works, Peirce provides the following scenario. “Suppose I enter a room and there find a number of bags, containing different kinds of beans. On the table there is a handful of white beans; and, after some searching, I find one of the bags contains white beans only. I at once infer as a probability, or as a fair guess, that this handful was taken out of that bag. This sort of inference is called *making an [sic] hypothesis*. It is the inference of a *case* from a *rule* and *result*.”¹¹⁰ Since, deductive reasoning proceeds from the general law (the rule), through the specific case, to the particular observation (the result), in this scenario, deduction reasons that: (1) all the beans from this bag are white (the rule); (2) these beans are from this bag (the case); (3) therefore these beans are white (the result).¹¹¹

Conversely, inductive reasoning proceeds from the particular observation (the result) through the case, to the general law (the rule). In the scenario, induction reasons that: (1) these beans are white (the result); (2) these beans are from this bag (the case); (3) therefore all the beans from this bag are white (the rule). Abductive reasoning proceeds from the particular observation (the result), but then introduces a hypothesis (the rule) by which the case is abducted. In the above scenario, abduction reasons that: (1) these beans are white (the result); (2) all the beans from this bag are white (the rule); (3) therefore these beans are from this bag (the case).¹¹² Figure 2 demonstrates the relationship between the three modes of reasoning. The boxes with continuous lines contain premises

¹¹⁰Nathan Houser and Christian Kloesel, eds., *The Essential Peirce: Selected Philosophical Writings*, vol. 1 (Bloomington, IN: Indiana University Press, 1992), 188.

¹¹¹Hans Rudi Fischer, “Abductive Reasoning as a Way of Worldmaking,” *Foundations of Science* 6, no. 4 (2001): 365-356.

¹¹²Fischer, “Abductive Reasoning as a Way of Worldmaking,” 357.

or hypotheses that are assumed to be given or true. Boxes with dotted lines contain hypotheses that are inferred.¹¹³

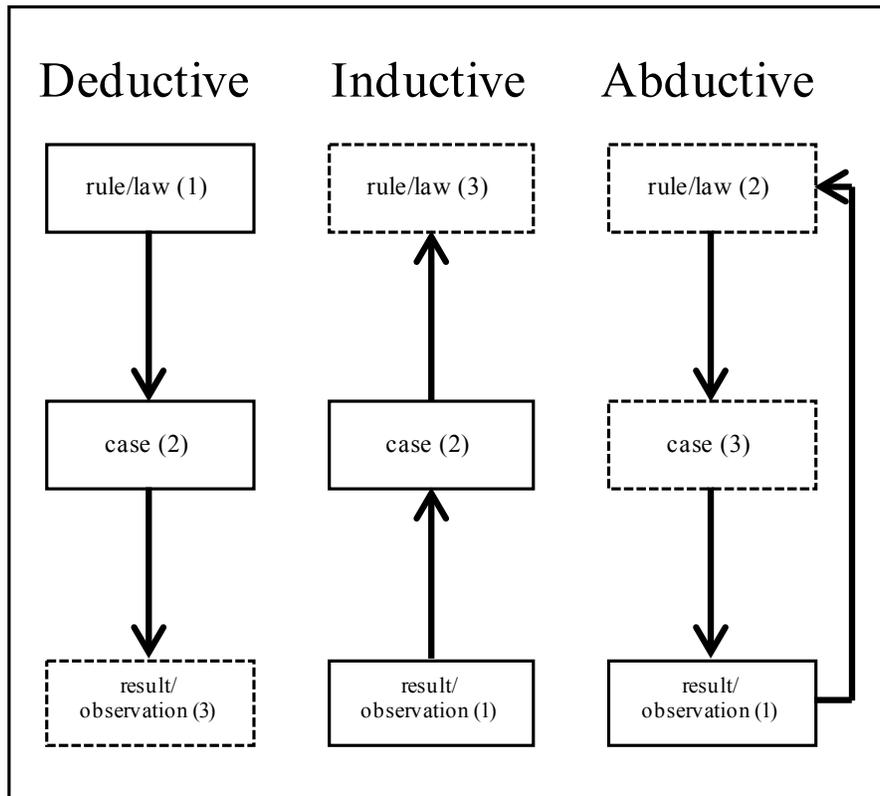


Figure 2. Forms of Reasoning

Source: Hans Rudi Fischer, "Abductive Reasoning as a Way of Worldmaking," *Foundations of Science* 6, no. 4 (2001): 365.

Abductive Reasoning and the Military Professional

How can abductive reasoning help military professionals in their expert work? In an era of persistent conflict, the Army is frequently expected to successfully intervene in

¹¹³Ibid.

numerous operational environments, each with unique characteristics and high levels of complexity. Therefore, military professionals need to cultivate an ability to accurately develop an understanding of the operational environment which includes the human domain. One reason for this is that military intervention into volatile situations can have unintended consequences. In his testimony before the Senate Armed Services Committee, General Dempsey said “before we take action, we have to be prepared for what comes next. The use of force, especially in circumstances where ethnic and religious factors dominate, is unlikely to produce predictable outcomes.”¹¹⁴

Abductive reasoning as defined by Ian Shapiro can help military professionals develop an understanding of the complexities present in an operational environment. Shapiro states abduction is “reasoning on the basis of *mature theories* from observed effects to unobservable causes. Abduction to unobservables is a way of generating knowledge in which *theory plays a vital role*,” (emphasis added).¹¹⁵ Theories are important because they are “an ordered set of assertions about a generic behavior or structure assumed to hold throughout a significant broad range of specific instances.”¹¹⁶ Furthermore, “the primary goal of a theory is to answer the questions of *how, when, and*

¹¹⁴Patrick Goodenough, “Assad Warns West About Terror Blowback As U.S. Sends More Troops to Jordan,” Cybercast News Service, 18 April 2013, <http://cnsnews.com/news/article/assad-warns-west-about-terror-blowback-us-sends-more-troops-jordan> (accessed 4 August 2014).

¹¹⁵Shapiro, *The Flight from Reality*, 39.

¹¹⁶John W. Sutherland, *Systems: Analysis, Administration, and Architecture* (Madison, WI: Van Nostrand Reinhold Company, 1975), 9.

why, unlike the goal of description, which is to answer the question of *what*.”¹¹⁷ Finally, the function of a theory “is that of preventing the observer from being dazzled by the full-blown complexity of natural or concrete events.”¹¹⁸ Military professionals can consult mature theories to help develop an understanding of why events are taking place in an operational environment. Sometimes this knowledge can be complementary, thereby helping create a richer understanding of the dynamics and other times this knowledge can be contradictory, forcing a mindful decision about which perspective best describes the current context.¹¹⁹

Fotini Christia, Associate Professor of Political Science at the Massachusetts Institute of Technology and author of *Alliance Formation in Civil Wars*, provides an example of how the incorporation of both complimentary and contradictory theories can help develop an understanding of an operational environment. In her article entitled, “What Can Civil War Scholars Tell Us About the Syrian Conflict?” Christia uses more

¹¹⁷Samuel B. Bacharach, “Organizational Theories: Some Criteria for Evaluation,” *Academy of Management Review* 14, no. 4 (1989): 498.

¹¹⁸C. S. Hall and G. Lindzey, *Theories of Personality* (New York: Wiley, 1957), 9.

¹¹⁹This concept has been a central component of the Local Dynamics of War Scholars Program at the Command and General Staff College. For more information about the Local Dynamics of War Scholars Program see: Gordon B. Davis, Jr. and James B. Martin, “Developing Leaders to Adapt and Dominate for the Army of Today and Tomorrow,” *Military Review* 92, no. 5 (September-October 2012). For recent work on abductive reasoning and the military professional see: Celestino Perez, Jr., “High-Stakes Political Judgment: An Analytically Eclectic Framework for *Thinking What We are Doing*,” A paper presented at the 70th Annual Meeting of the Midwest Political Science Association on 12 April 2012; Houston Sheets, “An Abductive Reasoning Model for the Military Practitioner Operating Overseas,” A paper submitted on 2 December 2013 as a partial requirement for graduation from the Local Dynamics of War Scholars Program; Celestino Perez, “A New Approach to Doing Military Ethics,” in *Handbook on Research Methods in Military Studies*, eds. Joseph Soeters, Patricia Shields, Sebastiaan Rietjens (New York: Routledge Press, 2014).

than 30 different scholarly articles in only 1,912 words (which is one citation for every two or three sentences) to help explain the dynamics of the Syrian conflict. She writes, “The media has cast the brutal fight, which started with peaceful protests against the Assad regime in March 2011, in largely sectarian terms. The Sunni-versus-Alawite cleavage, however, is overly simplistic as it ignores ethnic distinctions among the different Sunni groups in Syria . . . Instead, there are multiple underlying ideological, ethnic, tribal, religious, and sectarian narratives that seem to be operating at once.”¹²⁰ She explains that the conflict is between: a repressed majority and the dominant minority; the center and periphery; secular and religious/jihadist groups; Baathist and non-Baathist; and between undisciplined soldiers concerned with personal gain and civilian populations.¹²¹ Additionally, there are some Sunnis in the middle and upper classes who support the regime, or at least do not support opposition forces, in order to maintain the status quo.

Next, Christia explains the regime’s use of indiscriminate violence against the civilian population, although causing some to support opposition forces, can actually help the regime.¹²² When attacked, people flee to areas secured by either government or opposition forces, making it easier for the regime to distinguish supporters from opponents. An unintended consequence of this, though, is the large number of internally

¹²⁰Fotini Christia, “What Can Civil War Scholars Tell Us About the Syrian Conflict?” *POMEPS Briefing 22* (Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, December 2013), 8-10.

¹²¹*Ibid.*, 8.

¹²²*Ibid.*, 9.

displaced persons. While this has prompted the United States to provide development aid for humanitarian reasons, Christia cites studies conducted in both Iraq and Afghanistan that suggest provisions help decrease violence. However, this occurs only in areas not already experiencing high levels of violence. This understanding could help the U.S. military determine where and when to provide aid.¹²³

Finally, speculating about the future of the Syrian conflict and the prospects for its resolution, Christia explains contrary to the mainstream narrative, that the fighting is between the government and the opposition, there are nearly 1,000 distinct rebel forces.¹²⁴ This suggests the conflict will not end soon as it is difficult to get unity among the fragmented groups. Additionally, when both sides receive external support, the fighting and violence will most likely continue because neither side is able to secure outright military victory.¹²⁵

Christia points out, if conflict termination is the goal and outright military victory by one side is not possible, negotiated settlement becomes the only option. However, a negotiated settlement must be enforced by an outside arbiter, otherwise the stronger party will most likely break the agreement.¹²⁶ Also, Christia highlights that although enforced agreements tend to increase the duration of post-conflict peace, they do not shorten ongoing conflicts.¹²⁷ This understanding is important since the United States has decided

¹²³Ibid.

¹²⁴Ibid.

¹²⁵Ibid., 10.

¹²⁶Ibid.

¹²⁷Ibid.

to support the Free Syrian Army, the least fragmented opposition group. If the United States does not provide them with the ability to overthrow the regime, then the conflict will most likely continue.¹²⁸

According to General H. R. McMaster, “war’s uncertainty and non-linearity are results of war’s political and human dimensions as well as the continuous interaction with determined, adaptive enemies. And wars are uncertain because they are contests of wills that unleash unpredictable psychological dynamics.”¹²⁹ Mature theories like the ones used in Christia’s article, developed in the social sciences by political scientists, are useful for military professionals responsible for intervening in complex adaptive environment. Understanding theories about interstate war, the appropriate use of military power, civil wars, ethnic conflict, alliance formation, conflict resolution, violence against civilian populations, and other causal logics, can help military professionals interpret the complexity by explaining the causality.¹³⁰ While no two situations are exactly alike,

¹²⁸Barbara F. Walter, “The Four Things We Know About How Civil Wars End,” *POMEPS Briefing* 22, 28-30; Jonah Schulhofer-Wohl, “Fighting Between Allies and the Civil War in Syria,” *POMEPS Briefing* 22, 42-44; Alexander Downes, “Why Regime Change is a Bad Idea in Syria,” *POMEPS Briefing* 22, 61-63.

¹²⁹H. R. McMaster, “Studying War and Warfare,” *War Council Blog*, 13 January 2014, <http://www.warcouncil.org/blog/2014/1/11/studying-war-and-warfare-by-major-general-hr-mcmaster> (accessed 29 May 2014).

¹³⁰Patricia L. Sullivan, “War Aims and War Outcomes: Why Powerful States Lose Limited Wars,” *Journal of Conflict Resolution* 57, no. 3 (2007): 496-524; Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton, NJ: Princeton University Press, 2004); Stathis Kalyvas, *The Logic of Violence in Civil War* (Cambridge, MA: Cambridge University Press, 2006); Stathis Kalyvas and Matthew Adam Kocher, “Ethnic Cleavages and Irregular War: Iraq and Vietnam,” *Politics and Society* 35, no. 2 (June 2007): 183-223; Fotini Christia, *Alliance Formation in Civil Wars* (Cambridge, MA: Cambridge University Press, 2012); Severine Autesserre, *The Trouble with the Congo: Local Violence and the Failure of International Peacebuilding* (Cambridge, MA: Cambridge University Press, 2010); Stathis Kalyvas, Ian Shapiro, and

knowing theories about human behavior in similar situations can help military professionals develop an understanding and provide a starting point for intervention.

Conclusion

According to the *Capstone Concept for Joint Operations: Joint Force 2020*, “Future Joint Forces will face an increasingly complex, uncertain, competitive, rapidly changing, and transparent operating environment characterized by security challenges that cross borders. Conflicts could arise with other states or with increasingly powerful non-state actors, both of whom have access to advanced weapons.”¹³¹ Abductive reasoning is proffered as a way to help military professionals develop an understanding of the complexities present in an operational environment that includes numerous interacting and complex adaptive systems of the human domain. Achieving an understanding in this environment requires increasingly more human input while processing data, analyzing information, and synthesizing and applying judgment to knowledge. To progress from information to knowledge requires the integration of expert opinion, mature theories, or experience. While operational and mission variables, civil considerations, and a systems perspective are good for building a base of information, apart from expert opinion, mature theories, or experience these methodologies will not help military professionals create knowledge or achieve understanding.

Tarek Masoud, *Order, Conflict, and Violence* (Cambridge, MA: Cambridge University Press, 2008); Craig Parsons, *How to Map Arguments in Political Science* (Oxford, UK: Oxford University Press, 2007).

¹³¹Martin E. Dempsey, *Capstone Concept for Joint Operations: Joint Force 2020*, 10 September 2012, Defense Technical Information Center, <http://www.dtic.mil/doctrine/concepts/concepts.htm> (accessed 3 June 2014), 15.

CHAPTER 3

METHODOLOGY

Our organizations will be judged by the performance of leaders serving in areas where critical thinking skills are essential. We must ensure our leaders possess the ability to understand the security environment and the contributions of all elements of national power; lead effectively when faced with surprise and uncertainty; anticipate and recognize change and lead transitions; and operate on intent through trust, empowerment, and understanding.

— Raymond Odierno, John McHugh, and Raymond Chandler,
Army Leader Development Strategy 2013

As the epigraph highlights, military professionals must cultivate the ability to develop an understanding of an operational environment. Their actions have strategic and enduring effects. Therefore, the Army “must produce leaders who are capable of decisive action in the operational environment.”¹³² According to Les Brownlee and Peter J. Schoomaker, “The need to teach Soldiers and leaders *how to think* rather than *what to think* has never been clearer. To defeat adaptive enemies, we must out-think them in order to out-fight them.”¹³³ The purpose of this chapter is to explain the methodology used to assess the level of the Army’s cognitive hierarchy model achieved as represented by the CGSOC student groups’ presentations of the Syrian conflict. To explain the methodology used by this study, this chapter is divided into five sections. The first explains the role PowerPoint plays in the military. The second describes the different

¹³²Raymond T. Odierno, John M. McHugh, and Raymond F. Chandler, III, *Army Leader Development Strategy 2013*, United States Army Combined Arms Center, <http://usacac.army.mil/cac2/CAL/repository/ALDS5June%202013Record.pdf> (accessed 13 May 2014), 5.

¹³³Les Brownlee and Peter J. Schoomaker, “Serving a Nation at War: A Campaign Quality Army with Joint and Expeditionary Capabilities,” *Parameters* 34, no. 2 (Summer 2004): 18.

CGSOC student groups used in this study. The third provides examples of the levels of the Army's cognitive hierarchy model. The fourth explains how the Army's cognitive hierarchy model is used to assess the CGSOC student groups' presentations. The fifth explains the limitations of this study.

PowerPoint Presentations and the Military

PowerPoint presentations are ubiquitous throughout the military.¹³⁴ This form of communication arose in the late 1990s and became an indispensable way to convey ideas, motivate organizations, and persuade decision makers.¹³⁵ In fact, according to Thomas X. Hammes, a retired Marine colonel and author of *The Sling and the Stone: On War in the 21st Century*, PowerPoint has “fundamentally changed [the military] culture by altering the expectations of who makes decisions, what decision they make and how they make them.”¹³⁶ Hammes explains “before PowerPoint, staffs prepared succinct two- or three-page summaries of key issues. The decision-maker would read a paper, have time to think it over and then convene a meeting with either the full staff or just the experts involved to discuss the key points of the paper . . . In contrast, today, a decision-maker sits through a

¹³⁴Spencer Ackerman, “Microsoft Helps Army Avoid ‘Death by PowerPoint,’” *Wired*, 17 June 2011, <http://www.wired.com/2011/06/microsoft-helps-the-army-avoid-death-by-powerpoint/> (accessed 28 July 2014).

¹³⁵JoAnne Yates and Wanda Orlikowski, “The PowerPoint Presentation and Its Corollaries: How Genres Shape Communicative Action in Organizations,” in *Communicative Practices in Workplaces and the Professions: Cultural Perspectives on the Regulation of Discourse and Organizations*, eds. Mark Zachry and Charlotte Thralls (Amityville, NY: Baywood Publishing Company, Inc., 2007), 67-92.

¹³⁶Thomas X. Hammes, “Dumb-dumb bullets: As a decision-making aid, PowerPoint is a poor tool,” *Armed Forces Journal* (July 2009), <http://www.armedforcesjournal.com/essay-dumb-dumb-bullets/> (accessed 28 July 2014).

20-minute PowerPoint presentation followed by five minutes of discussion and then is expected to make a decision.”¹³⁷

Some military professionals link this change to negative performance outcomes. Herbert R. McMaster, commander of the Army’s Maneuver Center of Excellence, claims PowerPoint “is dangerous because it can create the illusion of understanding and the illusion of control,” and that “some problems in the world are not bullet-izable.”¹³⁸ Others say PowerPoint “stifles discussion, critical thinking and thoughtful decision-making.”¹³⁹ Additionally, according to Hammes, “instead of forcing officers to learn the art of summarizing complex issues into coherent arguments, staff work now places a premium on slide building.”¹⁴⁰ Yet, not all agree that PowerPoint can or should be blamed for the negative outcomes.

For example, guest columnist “Doctrine Man,” writing on Thomas E. Ricks’s *Foreign Policy* blog, claims “PowerPoint isn’t the problem, it’s just the symptom of a deeper problem years in the making. PowerPoint is merely a tool: it’s the tool behind the tool with whom we should concern ourselves.”¹⁴¹ According to him, military

¹³⁷Hammes, “Dumb-dumb bullets.”

¹³⁸Elisabeth Bumiller, “We Have Met the Enemy and He Is PowerPoint,” *The New York Times*, 26 April 2010, http://www.nytimes.com/2010/04/27/world/27powerpoint.html?_r=0 (accessed 29 July 2014).

¹³⁹Ibid.

¹⁴⁰Hammes, “Dumb-dumb bullets.”

¹⁴¹Doctrine Man, “We have met the enemy and he is us: A possible 4-step recovery program for PME,” Thomas E. Ricks *Foreign Policy* blog, 11 March 2014, http://ricks.foreignpolicy.com/posts/2014/03/11/we_have_met_the_enemy_and_he_is_us_a_possible_4_step_recovery_program_for_pme (accessed 30 July 2014).

professionals lack solid communication skills. His solutions are: first learn to write; second become more proficient at public speaking; third embrace professional reading in PME; and fourth teach military professionals how to effectively use communications tools, such as PowerPoint.¹⁴² In another example and in response to the criticisms about the Pentagon's Afghanistan slide depicting the complexity of the American military strategy (described as the "spaghetti slide"), Jerry Weissman, one of the world's top corporate presentations consultant, argues "the spaghetti-like image effectively illustrates the complexity of that situation."¹⁴³

Despite the perceived negative outcomes, the military continues to use presentations as one of several methods of assessment in the CGSOC. According to the Command and General Staff College form 1009S, the standard grading form used in CGSOC to assess speaking and presentations, the goal of presentations given in CGSOC is to "transmit a clear, concise, organized message that communicates the speaker's intent."¹⁴⁴ However, instead of using the Army's cognitive hierarchy model to evaluate the content of the student's presentation, the CGSOC uses *Bloom's Taxonomy of The Cognitive Level*, a classification system designed by Bloom et al. in 1956 to address the level of cognitive development achieved by educational goals and objectives.¹⁴⁵

¹⁴²Doctrine Man, "We have met the enemy and he is us."

¹⁴³Jerry Weissman, *Presentation Skills That Will Take You to the Top (Collection)* (Saddle River, NJ: Pearson Education, Inc., 2013), 39.

¹⁴⁴Student Text 22-2, *Writing and Speaking Skills for Army Leaders* (Fort Leavenworth, KS: U.S. Army Command and General Staff College, January 2009), D1-D3.

¹⁴⁵Benjamin S. Bloom, Max D. Englehart, Edward J. Furst, Walker H. Hill, and David R. Krathwohl, *Taxonomy of Educational Objectives: The Classification of*

CGSOC Student Groups Used in this Study

To test the utility of abductive reasoning for improving military professionals' ability to develop an understanding of an operational environment, five CGSOC student groups' PowerPoint presentations of the Syrian conflict are analyzed: four CGSOC student groups which do not explicitly employ abductive reasoning and one group which does (see table 2). These presentations represent all known presentations of the Syrian conflict completed by CGSOC students in the past two years.

The first two presentations, coded as Group 1 (Spring Elective) and Group 2 (Fall Elective), were completed by students in 2013 during the electives portion of the Fort Leavenworth resident CGSOC. These groups are from different iterations of the same elective given in 2013. Group 1 (Spring Elective) consisted of five students and Group 2 (Fall Elective) consisted of four students. Both groups had four classes spanning two weeks (two Tuesday classes and two Thursday classes) to prepare and present their material, giving their presentation on the second Thursday class. This was the final practical exercise for both groups. The purpose was “to prepare and deliver a PowerPoint presentation demonstrating an understanding of the complexities associated with the conduct of multinational operations within Syria.”¹⁴⁶

Educational Goals. Handbook I: Cognitive Domain (White Plains, NY: Longmans, 1956).

¹⁴⁶Student Handout for CGSOC Elective, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 2013. Instructions taken from the student handout.

Table 2. List of Groups Analyzed

Coded Group Name	Number of Students	Class Hours to Complete	Days to Complete	Completed
Group 1 (Spring Elective)	5	6	8	Spring 2013
Group 2 (Fall Elective)	4	6	8	Fall 2013
Group 3 (Satellite)	16	8	1	Summer 2013
Group 4 (Common Core)	16	6	1	Fall 2013
Group 5 (LDW)	7	16	4	Spring 2014

Source: Created by author.

Although the instructions included the word “understanding”, it is unclear whether the goal of this graded exercise was in accordance with the Army’s cognitive hierarchy model. There was no mention of the other levels of this model. Therefore, even if the goal was the same, the students were not provided with specific instructions about the hierarchical nature of achieving understanding as defined by Army doctrine.

The third presentation, coded Group 3 (Satellite), was completed by 16 students in 2013 at the Fort Belvoir, Virginia satellite CGSOC during the common core class C406, Operational Art and Operational Design. This group was given explicit instructions to use joint doctrine’s PMESII framework to develop an understanding of the Syrian conflict. This group was given these instructions the day prior to giving the presentation. On the day of the presentation, this group had eight hours to compile the material gathered the day prior and present the findings. As with Groups 1 and 2, it is unclear whether the goal of this graded exercise was to achieve understanding as defined by Army doctrine.

The fourth presentation, coded Group 4 (Common Core), was completed by 16 students in 2014 at the Fort Leavenworth resident CGSOC. This group was given instruction on the Army Design Methodology and PMESII-PT during the first two hours

of the 10-hour common core class C120, Critical and Creative Thinking. Each student in the class then chose which operational variable to develop and researched that variable that same night. The next day, students received instructions on a systems approach to understanding an operational environment and then developed an understanding as a group. Students presented the findings at the end of the class. As with the first three groups, it is unclear whether the goal of this exercise is to achieve understanding in accordance with Army doctrine.

The fifth presentation was completed by a CGSOC Local Dynamics of War (LDW) Scholars Program student group in the spring of 2014 and is coded as Group 5 (LDW). A Scholars Program is a “specialized group of alternative studies programs that offer select students the opportunity to make a dive into an important aspect of the operational art.”¹⁴⁷ The LDW Scholars Program “exposes students to cutting-edge scholarship on strategy, war, politics, governance, economics, culture, and ethics; this exposure imparts a rich appreciation for how military and nonmilitary factors combine to create tough planning challenges for commanders and staffs throughout the range of military operations and at all levels of war.”¹⁴⁸ To join the Scholars Program, students must be recommended and then selected by a committee. This group, which consisted of seven students, had four days to work on developing an understanding of the Syrian conflict, starting on Monday morning and briefing on Friday morning. The instructions for this group were as follows:

¹⁴⁷ Gordon B. Davis, Jr. and James B. Martin, “Developing Leaders to Adapt and Dominate for the Army of Today and Tomorrow,” *Military Review* 92, no. 5 (September-October 2012): 68.

¹⁴⁸Ibid.

You are to focus on a set of readings touching upon Syria. Each reading proffers multiple causal stories. Some of these stories are complementary insofar as they simply help fill out one's view of the "furniture" and dynamics that compose the world. Some of these stories are contradictory insofar as they provide clashing causal accounts of the past, present, or future. The intent of this exercise is for each person to wrestle with the material and apply William Connolly's and Craig Parsons's takes on causality. You should:

- (i) Produce a single, aggregate depiction of the open systems that are claimed to have an effect on the world.
- (ii) Produce and depict the various complementary and contrasting IV-DV [independent variables-dependent variables] causal stories described in the reading. Hence you should apply Parsons's causal logics to the reading.
- (iii) Returning to your ontology in (i), describe the system-wide effects that arise when each of the IV-DV relationships are brought together so as to contribute to an aggregate-level view. Apply Connolly's terms, such as open systems, energetic remainders, feedback, self-organization, etc.
- (iv) In light of your study, what approach might you take to intervene in the same case if you could rewind time? Think in terms of Connolly's "experimental action."

Each group is to capture your work in PowerPoint. The intent here is simply to portray your whiteboard work in a clear, organized, archivable manner.¹⁴⁹

While not explicit in the instructions above, the LDW Scholars Program syllabus states the intent of the course is to "increase appreciation for the complexity of the environment and improve political understanding insofar as *the political* comprises those phenomena that relate to the geographical, historical, cultural, and institutional plurality of human persons living in community."¹⁵⁰

¹⁴⁹Student Handout for CGSOC Scholar's Program, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 2014. Instructions taken from the student handout.

¹⁵⁰Ibid.

Table 3. Definitions Used for Achieving Understanding

Levels of the Cognitive Hierarchy Model	Definitions
Data	Are the lowest level of the model and are the products of observation. Data is raw and has no significance except for its existence, because it lacks context and interpretation. Data are discrete, objective facts which are unorganized and unprocessed and do not convey any specific meaning.
Information	Is data that has been processed to provide meaning and typically answers the questions of who, what, when, and where. This level of the model requires interpreting the context of the data and summarizing them into a more condensed form.
Knowledge	Is information to which is added expert opinion, skill and experience, to result in a valuable asset which can be used to aid decision making. Knowledge typically answers the question of how. Individual cognition and critical thinking are required to create knowledge. Knowledge is an explanation of the simple cause-and-effect (linear) relationship between elements of a system or between systems.
Understanding	Knowledge that has been synthesized and had judgment applied to it to comprehend the situation's inner relationship. Explains the why of observed phenomena in a situation. Understanding describes the hidden or counterintuitive (the non-linear) relationships between elements of a system or between systems.

Source: Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7; Russell L. Ackoff, “From Data to Wisdom,” *Journal of Applied Systems Analysis* 16 (1989): 3-9; Jennifer Rowley, “The Wisdom Hierarchy: Representations of the DIKW Hierarchy,” *Journal of Information Science* 33, no. 2 (2007): 163-180; Keri E. Pearlson and Carol S. Saunders, *Managing and Using Information Systems: A Strategic Approach*, 4th ed. (Hoboken, NJ: John Wiley and Sons, 2010), 349; Gene Bellinger, Durval Castro, and Anthony Mills, “Data, Information, Knowledge, and Wisdom,” *Systems Thinking*, 2004, www.systems-thinking.org/dikw/dikw.htm (accessed 10 June 2014), 1; European Committee for Standardization, *European Guide to Good Practice in Knowledge Management: Part 1: Knowledge Management Framework* (Brussels: CEN, March 2004), http://enil.ceris.cnr.it/Basili/EnIL/gateway/europe/CEN_KM.htm (accessed 23 July 2014), 6.

Examples of the Army’s Cognitive Hierarchy Model

The Army’s cognitive hierarchy model for achieving understanding is used to analyze the content of the CGSOC student groups’ presentations. Table 3 provides a summary of both the Army’s and scholars’ definitions, explained in chapter 2, for each

level of the model. To further differentiate knowledge and understanding, two additional aspects are added. First, knowledge is further defined in this study as an explanation of the simple cause-and-effect (linear) relationship(s) between elements of a system or between systems. Second, understanding is further defined in this study as explaining the hidden or counterintuitive (non-linear) relationship(s) between elements of a system or between systems. An example and explanation of each level of the Army's cognitive hierarchy model is given in the following two paragraphs.

An example of data is: Syria has approximately 22.40 million people.¹⁵¹ This is an objective fact which lacks context and does not convey a specific meaning. This fact does not inform whether this number is large or small, whether this is an increase or decrease, or whether these people are of the same religion, class, ethnicity, or nationality. An example of information is: Syria's population in 2012 was 22.40 million of which 86 percent was Muslim (which includes Sunni 74 percent and Alawi at twelve percent), ten percent was Christian, three percent was Druze, and one percent was Ismaili, Yezidi, and Jewish.¹⁵² This answers the questions of who, what, when, and where. Additionally, this information provides the basic context of the data. However, this information does not include expert opinion about the meaning behind the numbers and percentages.

To the previously provided information, an example of knowledge is: Syria's Alawite population aligns itself with President Bashar al-Assad (who is from the Alawite

¹⁵¹The World Bank, "Syrian Arab Republic Data," The World Bank Group, <http://data.worldbank.org/country/syrian-arab-republic> (accessed 10 June 2014).

¹⁵²"Syria's Alawites, a secretive and persecuted sect," Reuters, 31 January 2012, <http://www.reuters.com/article/2012/01/31/us-syria-alawites-sect-idUSTRE80U1HK20120131> (accessed 10 June 2014).

sect) while the Sunni population aligns itself with the opposition forces.¹⁵³ This answers the question of how the Alawite and Sunni populations are aligned within Syria. This explains the simple cause-and-effect relationship of these two populations. However, it does not account for those within the Sunni population, for example, who do not support the Assad regime. Therefore, an example of understanding is: To maintain the status quo, in Syria, large numbers of Sunnis, especially those in the middle and upper classes, have stayed loyal to the regime or have been unwilling to join the rebellion. This is a counterintuitive conclusion given the fact that the accepted narrative of the Syrian civil war is a conflict between the Alawite minority-ruled government and the oppressed majority Sunni state.¹⁵⁴ This answers the question of why some Sunnis support the Assad regime.

Analyzing the Content of PowerPoint Presentations

There are three steps used in this study to assess the CGSOC student groups' presentations: familiarization, assessment, and comparison. The first step is to become familiar with the structure of the entire presentation. Initially, an effort is made to determine if a particular approach is used to develop an understanding of the operational environment. According to Army and joint doctrine, a few approaches are useful: the Army Design Methodology; the Military Decision Making Process; or a systems

¹⁵³Thomas R. Pickering, "A Diplomat's Perfect Storm: How to Move Forward in Syria," *Prism* 4, Syria supplement (2014): 6-13.

¹⁵⁴Christia, "What Can Civil War Scholars Tell Us About the Syrian Conflict?" 8-10.

approach, such as relationships, actors, functions, and tensions. Each of these approaches uses the operational variables, mission variables, or civil considerations.¹⁵⁵

Additionally, a search is conducted for concept maps, visual models, or graphics used to depict the relationships between systems in the operational environment. These help establish the context of the situation. Army doctrine states that “the complexity of some problems requires creating a model of the problem. A visual model, based on logical inference from evidence, helps creative thought to develop into understanding. A graphic can often point to hidden relationships that were not considered through conversation alone.”¹⁵⁶ Finally in the first step, a search is conducted for sources or mature theories used to develop an understanding of the operational environment.

The second step is to assess the material contained in the presentations. To do this, the Army’s cognitive hierarchy model is applied to the material contained in the CGSOC student groups’ PowerPoint presentations. To maintain the integrity of a presentation, a chart was created to record the slide number, the slide theme (usually presented in the agenda slide), the system elements and dynamics, the connections, and which level of the cognitive hierarchy model the group achieved as assessed in this study (i.e., data, information, knowledge, or understanding) (see figure 3). The next two paragraphs explain this process.

¹⁵⁵Headquarters, Department of the Army, Army Doctrine Reference Publication 5-0, 1-7; Joint Chiefs of Staff, Joint Publication 3-0, IV-4 to IV-5; Headquarters, Department of the Army, Army Doctrine Reference Publication 3-07, *Stability Operations* (Washington, DC: Government Printing Office, August 2012), 4-8.

¹⁵⁶Headquarters, Department of the Army, Army Doctrine Reference Publication 5-0, 2-5.

The level of the cognitive hierarchy model assigned to a slide's material accounts for the context in which the material is presented. For example, in figure 3 under the heading Unrealistic Expectations on All Sides, Group 2 (Fall Elective) states, "The West is hoping the violence will disappear (whether through Tahrir-like demonstrations; military defections; or a palace coup); or the opposition will become more cohesive, and more clearly sympathetic to Western interests."¹⁵⁷ This statement on its own would be classified as information. However, because this is under the heading Unrealistic Expectations, it is classified as knowledge.

Yet, it is not classified as understanding because of the simplicity of the analysis made by Group 2 (Fall Elective). The West (presumably the United States) is doing everything but simply hoping the violence disappears, as it has been exploring many avenues to stop the Syrian conflict (e.g., diplomatic, military, and economic). Additionally, history and scholarly literature show that civil wars do not simply disappear, but can continue on for decades in the absence of third-party intervention.¹⁵⁸ To say that the West is hoping for the violence to disappear is not only an unrealistic expectation, it is in the first place, not a probable expectation the United States would have.

¹⁵⁷Group 2 (Fall Elective), PowerPoint presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, September 2013.

¹⁵⁸Walter, 28-30; Schulhofer-Wohl, 42-44.

Unrealistic expectations on all sides

- In Syria
 - The regime wants the opposition to surrender
 - Many Syrians bank on international intervention
 - Some think Russia and the West will go through a rapprochement
 - Some think the opposition will be eradicated, and the former status quo will return
- Russia and China – driven by their aversion to popular protests, and Western intervention – will hope that Assad somehow calms things, whether through military or domestic political means. Russia realizes that its continued relevance depends on its continued role as maverick
- The West is hoping the violence will disappear (whether through Tahrir-like demonstrations; military defections; or a palace coup); or the opposition will become more cohesive, and more clearly sympathetic to Western interests



SNC chairman Burhan Ghalioun has had trouble uniting the opposition, and has recently changed his posture in support of armed opposition.



Western diplomats say the SNC is far from achieving the recognition given to Libya's NTC.

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
18	Unrealistic Expectations on all Sides	In Syria:	(1) the regime wants the opposition to surrender; (2) Many Syrians bank on international intervention; (3) Some think Russia and the West will go through a rapprochement; (4) Some think the opposition will be eradicated, and the former status quo will return	Knowledge
		Russia and China:	(1) driven by their aversion to popular protests, and Western intervention, they will hope that Assad somehow calms things, whether through military or domestic political means. Russia realizes that its continued relevance depends on its continued role as maverick	Knowledge
		The West is hoping the violence will disappear	(whether through Tahrir-like demonstrations; military defections; or a palace coup); or the opposition will become more cohesive, and more clearly sympathetic to Western interests	Knowledge

Figure 3. Evaluation of Group 2's (Fall Elective) PowerPoint Slide

Source: Created by author using information from Group 2 (Fall Elective), PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, September 2013.

Another example is from Group 5 (LDW), shown in figure 4. This group explains how a fragmented opposition leads to a longer war, identifying each causal explanation as one of Craig Parsons's four causal logics: structural, institutional, ideational, or

psychological.¹⁵⁹ Additionally, each of the causal claims is supported using a reference to the source of the casual statement. For example, this group cites Paul Staniland who proffers one reason an opposition is fragmented is due to the structure of prewar networks, which influences the structure of armed groups.¹⁶⁰ This group classifies this causal logic as institutional. This demonstrates understanding since existing knowledge has been synthesized: the causal logic classification, the reason the opposition is fragmented, and the types of prewar political networks. Additionally, according to Jonah Schulhofer-Wohl, U.S. aid has had an unintended impact, causing opposition fragmentation, which this group classifies as institutional causal logic.¹⁶¹

The third step, comparison, consists of tallying each group's assessment and then comparing across all five groups. Using the Count-If tool in Microsoft Excel all connections classified as data, information, knowledge, and understanding are counted and those totals are divided by the total number of connections made within the presentation. For example, Group 1 (Spring Elective) made a total of 29 connections classified as knowledge. This group made a total of 84 connections. Therefore, 34.52 percent of this group's presentation is classified as knowledge (see figure 9 in chapter 4).

¹⁵⁹Parsons.

¹⁶⁰Paul Staniland, "Insurgent Organization and State-Armed Group Relations: Implications for Syria," *POMEPS Briefing* 22, 36-39.

¹⁶¹Schulhofer-Wohl, 42-44.

FRAGMENTED OPPOSITION (LONGER WAR)	
(Structural): Political fragmentation is a result of internal and external actors. Social fragmentation is a result of cleavages (Pearlman 40).	<ul style="list-style-type: none"> • Political unity varies, social structure remains constant • External support undermines and changes opposition actors
(Institutional): Structure of prewar political networks influences structure of armed groups (Staniland 36).	<ul style="list-style-type: none"> • Integrated, Vanguard, Parochial, Fragmented
(Psychological): Threats to survival generate cooperation among armed actors (Wohl 42)	<ul style="list-style-type: none"> • Safety: Without it, groups fight the regime. With it, groups fight each other. • (Institutional): US aid had unintended impact (fragmenting the opposition).
Two things determine effectiveness of rebel governance systems (Mampilly 44).	<ul style="list-style-type: none"> • (Ideational): Support of the civilian populace ("must identify with the rebel cause") • (Structural): Territorial control

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
11	Casual Stories: Fragmented Opposition (Longer War)	Political fragmentation is a result of internal and external actors. Social fragmentation is a result of cleavages; (1) Political unity varies, social structure remains constant; (2) External support undermines and changes opposition actors	This group labels this a structural causal logic (as defined by Craig Parsons); This group cites this (Pearlman 40)	Understanding
		Structure of prewar political networks influences structure of armed groups; (1) Integrated, Vanguard, Parochial, <u>Fragmented</u>	This group labels this an institutional casual logic; Cite this (Staniland 36)	Understanding
		Threats to survival generate cooperation among armed actors; (1) Safety: Without it, groups fight the regime. With it, groups fight each other; (2) US aid had unintended impact (fragmented the opposition)	This group labels this a psychological casual logic and labels (2) as an institutional casual logic. They cite this (Wohl 42)	Understanding
		Two things determine effectiveness of rebel governance systems: (1) Support of the civilian populace ("must identify with the rebel cause"); (2) Territorial control	This group cites this as (Mampilly 44); They label (1) as an ideational causal logic and (2) as a structural causal logic	Understanding

Figure 4. Evaluation of Group 5's (LDW) PowerPoint Slide

Source: Created by author using information from Group 5 (LDW). PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, January 2014.

Limitations

In this study, an analysis is conducted on the content of five CGSOC student groups' PowerPoint presentations on the Syrian conflict. Typically for a grade, these presentations are briefed to a Small Group Advisor, a Command and General Staff

College faculty member, who assesses both the content of the presentation and the accompanying spoken narrative provided by the students in the group. However, in this study, only the content of the presentations is assessed. For Groups 1 through 4, no video or audio records exist which could be included in the assessment.

The Army's cognitive hierarchy model clearly states expert opinion must be added to information to create knowledge. If there is no evidence of this, then the material is classified as data or information. For example, in figure 5 the heading of the slide is "Key Political Actors and Interest Groups". Applying the cognitive hierarchy model, this slide contains only information as only context is provided (i.e., answers the question of what). However, no expert opinion is given. This group claims that the Private Sector is a key actor or interest group, yet does not specify who specifically the private sector is or why they are key. How did this interest group boost the economy? Why would the briefer claim that the oil export business needs to be streamlined just because much of it is explored by the private sector? Additionally, why does the government need to support agri-business? There is no supporting evidence (i.e., either using citation or by providing additional material) or casual connections presented in the slide to support these claims. Finally, it is curious that only half of the slide is used. Are the two sentences on the slide the only evidence this group wishes to convey about the private sector? Where is the answer to the question of why this is important to the Syrian conflict?

In contrast to the example presented in figure 5, it is possible to use PowerPoint to convey complex ideas. For example, figure 6 is a transition slide designed to give the big picture, through time, of the experimental action the United States could have taken in

Syria from the 1970s until the present time.¹⁶² The five small visual models with lines to the timeline along the bottom of the slide are discussed in separate slides. Using a slide like this, a briefer is able to discuss the United States-Syria relationship through time, describing when and why the United States could have experimentally intervened in Syria. This single slide can facilitate answering the questions of who, what, when, where, how, and why, thereby demonstrating that this group achieved understanding on this topic.

Another limitation is the chair for this study is the small group instructor for the LDW Scholar's Program. Additionally, the author of this study is a member of the LDW Scholar's Program, though not a member of Group 5 (LDW). During the time Group 5 (LDW) created the presentation, the author was assigned to a different group focused on the Iraq War. While there was a video created for Group 5's (LDW) presentation, it was not used during this study's assessment of Group 5's (LDW) presentation.

¹⁶²Experimental action or intervention is described by General Martin Dempsey in Chapter 2. He states that it is similar to the Heisenberg principle in physics, where there is no specific path that will lead to a given end state. In the human domain, there are numerous unintended consequences which cannot possibly be known at the start of an action or intervention. Therefore, to plan as though specific actions will have specific outcomes may be misleading. In some instances, it may be better to plan an action and wait to see what the outcome is before planning a sequential action.

Key Political Actors and Interest Groups

Private Sector:

- Syrian economy mainly relies on Oil and Agriculture which had boosted the economy before the rebellion that is on going. Much of the of the oil is explored by the private sector hence the need to streamline it
- 75% land is privately owned and government has to take key steps to promote agri-business

Figure 5. Example of a Slide which Conveys only Data and Information

Source: Group 2 (Fall Elective), PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, September 2013.

A final limitation of this study is not all conditions were the same for all five groups. Some groups had more people, time, and instruction than others. Additionally, the presentations were given at different times in the CGSOC academic cycle. For example, Group 4 (Common Core) gave the presentation within the first week of CGSOC while Groups 1, 2, and 5 gave the presentations after the Advanced Operations Course, approximately in the 33rd to 36th week. Group 3 (Satellite) completed their briefing during the 16th week of CGSOC.

EXPERIMENTAL ACTION

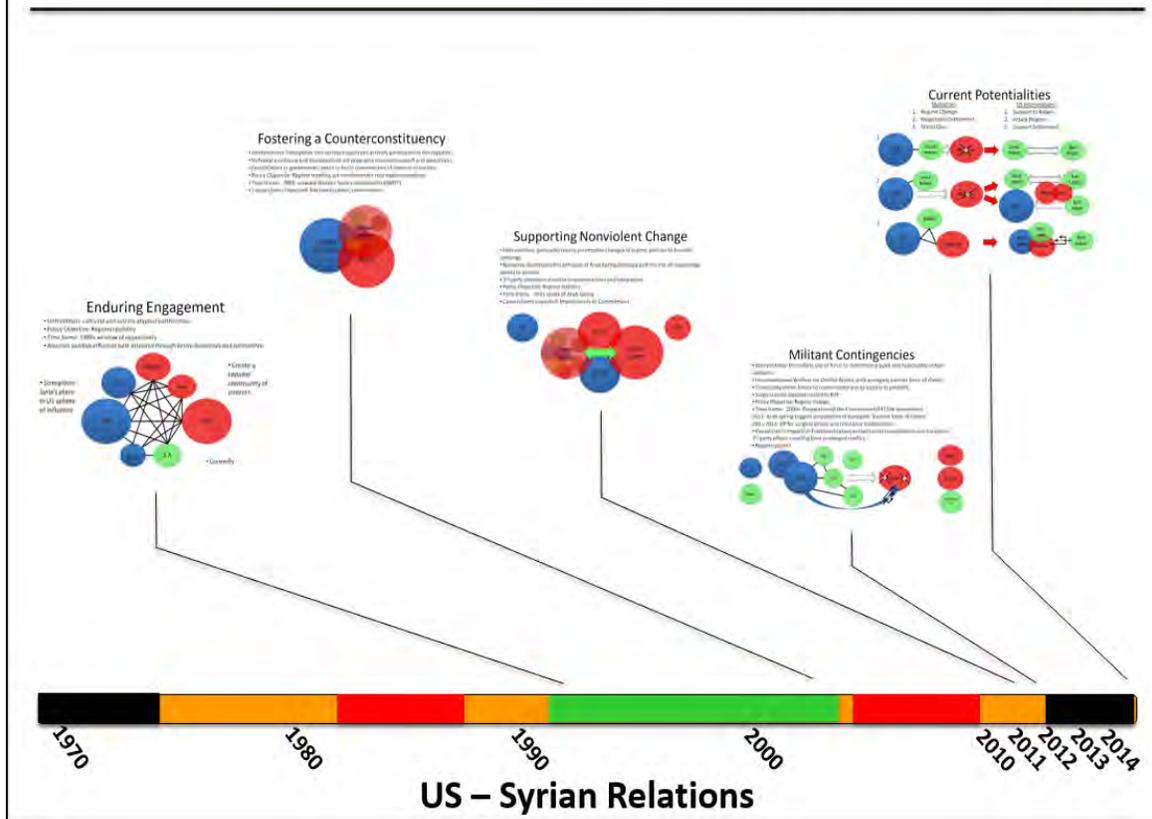


Figure 6. Example of a Slide which Conveys Knowledge and Understanding

Source: Group 5 (LDW), PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, January 2014.

Conclusion

To answer the research question and test the utility of abductive reasoning, five CGSOC student groups' depictions of the Syrian conflict are assessed using the Army's cognitive hierarchy model presented in ADRP 6-0. The four levels of this model from lowest to highest are: data, information, knowledge, and understanding. To make sound

decisions, commanders need more than information.¹⁶³ “When making decisions, commanders strive to develop and maintain an understanding of the situation.”¹⁶⁴ One way military professionals can demonstrate understanding is to display their conceptualization of the complexities of an operational environment in a PowerPoint presentation. PowerPoint presentations are still used in the CGSOC as one of several methods of assessment of students’ ability to develop an understanding. This chapter explains the methodology used to assess five CGSOC student groups’ presentations of the Syrian conflict. Chapter 4 will present the results and discussion of this assessment.

¹⁶³Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

¹⁶⁴Ibid.

CHAPTER 4

ANALYSIS

CGSOC Student Groups' Presentations on the Syrian Conflict

Group 1 (Spring Elective) organized the presentation into eight parts over 20 slides (see table 4). Five students contributed to this presentation. This group used six class hours and had eight days to complete the assignment. There are 1,540 words in the presentation. No visual model, using nodes and links to depict the complexity of the Syrian conflict, is depicted in the presentation. Additionally, no references or citations are included.

The first part of the presentation covers background information on Syria's government structure, and key events and dates. The second part lists key political actors and interest groups within Syria, divided into seven categories: ethnic, religious, influential individuals, political parties, militias, civil society institutions, and the private sector. The third part discusses the catalysts, principal demands, and pressures for reform, finding that the "fight is much more about the implications for redistribution of power between communities in Syria than it is about constitutionalism and democracy. The fight is between the majority Sunni population and the minority Alawite (Shiite) regime backed by other minorities (mainly Christians and Druze)." ¹⁶⁵

The fourth part explains the Syrian government's response to external and internal demands for reform. Group 1 (Spring Elective) acknowledges that the Assad regime's concessions were only superficial. In other words, though Assad "repealed the

¹⁶⁵Group 1 (Spring Elective), PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, 2013.

Emergency Law and approved new laws permitting new political parties, liberalizing local and national elections,”¹⁶⁶ he remains in power, declared a state of war, and continues to pursue the opposition aggressively. In part five Group 1 (Spring Elective) proposes some reforms that could lead to greater political stability, including the removal of Assad, the establishment of a permanent and representative government, and the return of refugees. In part six, this group highlights key constraints and restraints on these reforms. These are classified as external concerns (e.g., Assad is protected by Russia and Iran and his removal may lead to Hamas/Hezbollah attacking Israel and destabilizing Lebanon), political factors (e.g., Syria is really about the management and redistribution of ethnic and sectarian power, not democracy), and economic factors (e.g., regime change and nation building is an expensive business).

Group 1 (Spring Elective) states that the potential for civil war is also a key constraint on reform, noting the Syrian conflict is “pitting religious extremists against mainstream Islam across the entire Islamic world.”¹⁶⁷ The seventh part details “America’s Syria challenge,” including issues such as the flow of refugees to neighboring countries like Jordan, Lebanon, and Iraq, possibly destabilizing the region. The final part is a discussion of American options in the Syrian conflict noting that four components must be achieved simultaneously for intervention to be meaningful: national leadership; minimizing the civil war; understanding the true motives of Saudi Arabia and Qatar versus Iran; and a Peacekeeping force.

¹⁶⁶Group 1, PowerPoint Presentation.

¹⁶⁷Ibid.

Table 4. Assessment of Group 1's (Spring Elective) PowerPoint Presentation

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
1	Title Slide	"Arab Spring Revolt in Syria"	Labeling the conflict a revolt	Information
2	Agenda Slide	Six Sections		
3	Map of Syria	Syrian Arab Republic	Population: 22 million; size of North Dakota	Information
4	Government Structure	Type of Gov't:	Republic under an authoritarian regime	Data
		Duration of Current Gov't:	(1) President Bashar al-ASAD (since 17 July 2000)	Data
			(2) President approved by popular referendum for a second seven-year term (no term limits)	Information
			(3) Referendum last held on 27 May 2007 (next to be held in May 2014)	Information
			(4) The president appoints the vice presidents, prime minister, and deputy prime ministers	Information
		Basis of Law	(1) Mixed legal system of civil and Islamic law	Information
(2) Constitution date 13 March 1973; amended February 2012	Data			
(3) Legislative branch unicameral People's Assembly or Majlis al-Shaap (250 seats; members elected by popular vote to serve four-year terms)	Data			
(4) Elections last held on 07 May 2012 (next to be held in 2016)	Data			
5	Key Events/Dates:	(1) Independence Day: 17 April 1946 (from League of Nations mandate under French administration)	Data	
		(2) Ongoing civil war since 2011	Data	
		(3) Golan Heights is Israeli-occupied; UN Disengagement Observer Force patrolling a buffer zone since 1964	Data	
		(4) Lacking a treaty describing the boundary, portions of the Lebanon-Syria boundary are unclear	Data	
		(5) 2004 agreement and pending demarcation settles border dispute with Jordan	Data	
6	Ethnic Groups: (1) Indigenous Levantine people	(2) Kurds are spread out over southwest Asia	Form the majority of citizens as they are 26 million in Syria	Information
		(3) The other ethnic groups	5% are found in Syria	Information
		Religion: (1) Sunni Muslim (Islam - Official)	Those who originated from neighboring countries like Turkey, Israel, and Armenia	Information
		(2) Other Muslim	Islam is the official religion of Syria with 74% of the population	Information
7	Key Political Actors and Interest Groups	(2) Other Muslim	(Includes Alawite, Druz) are 16%	Information
		Influential Individuals: (1) President Bashar Assad	The most powerful individual in the Syrian government having ruled the country since 2000	Information
		(2) Maher Assad	Is Bashar's brother and commands the republican guard which is the best equipped army	Information
		(3) Mr. Rami Mahklouf	Is arguably the most powerful economically	Information
		(4) Abdul Fatah	Is the deputy director of the NSB	Information
		Political Parties: (1) Arab Socialist Baath Party	The predominant and the ruling party since 1963; this party is the key decision maker in Syria	Information
(2) Syrian Communist Party	In the last election it got 8 MPs and was publishing an anti-government news paper during the start of the current conflict	Information		
8	Key Syrian Leaders (pictures)	Maher Assad, Bashar Assad, Ali Mamluk	Data	
9	Militias: (1) Shibiha Militias	(2) The all-female militias of Syria	Pro-government armed civilians who fight rebels and the U.S. categorizes them as a terrorist group and spies for government	Information
		(3) Jabhat al Nusra	Specifically trained by the government to protect it against the rebels	Information
		Civil Society Institutions: (1) The People's Revolt	Militia affiliated with AQ - trying to oust Assad	Information
		(2) Nabd	One of the most vocal civil society movements which blew the whistle for the Syrian revolt	Information
		(3) The Free Syrian Army	Is a very profound movement that advocates for non-violence and seeks to unite different tribes	Information
			Brings together defected army officers and armed civilians fighting against the government	Information

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
10	Key Political Actors and Interest Groups	Private Sector: (1) Syrian economy mainly relies on Oil and Agriculture	This reliance boosted the economy before the current rebellion. Much of the oil is explored by the private sector hence the need to streamline it	Information
		(2) 75% of the land is privately owned	Government has to take key steps to promote agri-business	Information
11	Catalysts for Reform	Anti-government protests	Broke out in the southern province of Dar'a in March 2011 after teenagers were arrested, put in jail and brutalized for scribbling anti-Assad graffiti on a wall	Knowledge
			Influenced by major uprisings that began elsewhere in the region (e.g., Tunisia, Egypt, Libya)	Knowledge
		Syria was under Emergency Law since 1963 when the Ba'ath Party took power in a coup	Five principal security agencies monitor political dissent	Knowledge
			The state of emergency meant military courts apply martial law and special courts try political cases with no regard for human rights or due process	Knowledge
12	Principal Demands and Pressures for Reform	Frustration at the way the al-Assad regime has monopolized and exercised power. Protestors calling for the repeal of the restrictive Emergency Law allowing arrests without charge, the legalization of political parties, and the removal of corrupt local officials	Prisoners were routinely tortured and held in appalling conditions	Knowledge
				Knowledge
		Big Picture	(1) Fight is much more about the implications for redistribution of power between communities in Syria than it is about constitutionalism and democracy	Information
			(2) Struggle between the majority Sunni population and the minority Alawite (Shiite) regime backed by other minorities (mainly Christians and Druze)	Information
13	Governmental Responses to External or Internal Demands for Reform	In theory:	Al-Assad responded to unrest with a mix of concessions - including the repeal of the Emergency Law and approving new laws permitting new political parties and liberalizing local and national elections - and force	Knowledge
		In reality:	Assad remains in power, Assad had declared state of war; concern for the treatment of Assad's political base (minorities), the government's ongoing security operations to quell unrest and widespread armed opposition activity have led to extended violent clashes between gov't forces and oppositionists	Knowledge
			70K + deaths (6k in March 13)/ 3.5 million displaced Syrians	Information
14	Prospects for Meaningful Reforms Leading to Greater Political Stability	What reforms have been achieved?	In Dec 2012, the National Coalition of Syrian Revolution and Opposition Forces was recognized by more than 130 countries as the sole legitimate representative of the Syrian people	Knowledge
		What reforms remain?	Removal of Assad; establishment of permanent and representative government; return of refugees	Information
		(3) What dynamics support continued reform/revolution? There is too much traction to stop (pressure by international community + number of U.S. and Europe are aligned against the Russia and China - driven by aversion to popular protest, and Western intervention - hope Assad can calm		Information
		Russia realizes that its continued relevance depends on its continued		Data
		America's Syria Challenge - Security Concerns: (1) More refugees will flee to neighboring states and more armed groups will gain strength - threatening each of Syria's neighbors (Jordan,		Information
		(2) Increased instability may mean that Assad no longer has control over his		Information
		(3) Massive numbers of weapons already held by Syrian forces supporting Assad will fall into		Knowledge
		What dynamics support continued reform/revolution?	There is too much traction to stop (Pressure by international community + number of deaths & refugees = Assad must go)	Knowledge

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
15	[Graphic Depiction] Syria: Crisis and Competing Interests	Two big arrows colliding	One the one side is the Syrian National Coalition, Free Syrian Army with Super Powers (U.S. & Europe), Regional Powers (Saudi Arabia, Turkey, Israel, the Arab League, Qatar, and Jordan); On the other side is the Assad Government with Super Power (Russia), Regional Powers (Iran, Iraq, Hezbollah, and Hamas)	Knowledge
16		External Concerns	(1) Assad is protected by Russia and Iran	Knowledge
			(2) the conflict is pitting Iran and Saudi Arabia against each other, as they claim their role as the purported leaders of the Muslim world	Knowledge
			(3) Assad's removal may lead to Hamas/Hezbollah attacking Israel & destabilizing Lebanon.	Knowledge
			(4) Stockpile of chemical weapons fall into the hands of non-state actors	Information
			(5) Post-Assad gov't may seek to retake the Golan Heights from Israel	Knowledge
			(6) Collapse may turn Syria into a base for terrorism or arms supply against neighbors	Knowledge
			(7) Jordan and Lebanon concerned about absorbing/supporting refugees	Information
17	Key Constraints/ Restraints on Reform	Political Factors:	(1) Syria is really about management and redistribution of ethnic and sectarian power (not democracy)	Knowledge
			(2) Internal strife between the political activists inside of Syria and the exile groups	Information
			(3) Syrians have no tradition of unity - Ba'ath destroyed politics for 50 years. The only common goal they have is the removal of Assad	Knowledge
			(4) Syrian opposition remain too inexperienced politically to be able to form the kind of united team that could push for an acceptable political transition	Knowledge
			(5) Alawites, Christians and Kurds must be brought into the political fold	Information
		Economic Factors:	(1) Regime change and nation building is an expensive business (e.g., Iraq)	Information
			(2) Syrian economy devastated; oil reserves not like that of Iraq.	Knowledge
			(3) Western economies are weak	Information
18	Key Constraints/ Restraints on Reform	Potential for Civil War:	(1) Civil war between majority of the population and minority Assad loyalists that could go on for many years and polarize the Middle East	Knowledge
			(2) Syria conflict is pitting religious extremists against mainstream Islam across the entire Islamic world	Knowledge
			(3) Without a political solution, military assistance to the rebels, mainly from the Gulf states, is likely to intensify and the armed conflict will escalate. This may increase rebel abuse (abduction; prisoner abuse; execution; revenge attacks)	Understanding
			(4) Those who have fought for Assad regime and now feel their back to the wall are likely to remain armed, organized and willing to defend their turf (Latakia) (think Northern Alliance)	Understanding
			(5) The obvious solution is for the opposition to reach out and reassure the Alawites (Shia), Christians and other minorities - easier said than done.	Knowledge
19	America's Syria Challenge	Security Concerns	More refugees will flee to neighboring states and more armed groups will gain strength - threatening each of Syria's neighbors (Jordan, Lebanon, Iraq) with increased stability	Understanding
			Increased instability may mean that Assad no longer has control over his chemical weapons	Knowledge
		U.S. Political Consensus Lacking	Massive numbers of weapons already held by Syrian forces supporting Assad will fall into extremists hands once Assad falls	Knowledge
			U.S. Political Consensus Lacking: SECDEF Hagel and CJCS Dempsey are hesitant; SECSTATE Kerry sees opportunities in working with opposition; SENs Leving and McCain advocate increased US involvement	Understanding
20	Way Forward	Obama Administration recognizes that it cannot push too hard without ensuring all four pieces are in place:	(1) National Leadership - coherent transitional gov't and security apparatus to secure borders; protect populace; and control chemical weapons; (2) Minimizing Civil War - recognition of minorities and safe return of refugees; (3) Understanding true motives of Saudi Arabia and Qatar versus Iran; (4) Peacekeeping force	Understanding

Source: Created by author.

Group 2 (Fall Elective) organized the presentation into three parts over 18 slides (see table 5). Four students contributed to this presentation. This group used six class

hours and had eight days to complete the assignment. There are 1,225 words in the presentation. No visual model is depicted in the presentation. Additionally, no references or citations are included.

The first part covers the differences between the Syrian conflict and those in Libya and Egypt. The purpose is to show that even if the international community could agree on a strategy of military intervention, the reality of the situation is different in Syria than in Libya and Egypt. The second part lists key political actors and interest groups within Syria and is divided into seven clusters: ethnic, religious, influential individuals, political parties, militias, civil society institutions, and the private sector. Group 2 (Fall Elective) discusses eight different foreign fighter groups and three major opposition players: information for the Muslim Brotherhood is provided via a 10-minute Internet video documentary about the history and influence of the organization.¹⁶⁸ In part three, this group describes the opposition, examines possible links between the opposition and the regime, and evaluates expectations held by different internal and external actors involved in the Syrian conflict.

¹⁶⁸Am Yisrael Chai! “Brotherhood of Terror–The Muslim Brotherhood Part 1 of 4,” You Tube, http://www.youtube.com/watch?v=QdFG_VXBeeM (accessed 10 June 2014).

Table 5. Assessment of Group 2's (Fall Elective) PowerPoint Presentation

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved	
1	Title Slide	Syrian Conflict			
2	Mapping the Conflict	Map of areas controlled by different groups involved in the conflict	Syrian Army; rebel control; Kurdish groups; Contested Areas	Information	
3	How the War in Syria is Different from that in Libya	Syria's conflict has important implications for the entire region (Libya's less so)	The balance of regional power would significantly shift with the fall of the Assad regime; other regional players have an interest in sustaining the Assad regime	Information	
		The Syrian gov't has Russian air defences	Prevent easy airspace control by the west	Information	
		The Syrian gov't has the military power to crush a poorly armed opposition		Information	
		There are no easy or obvious arms supply routes to the opposition		Information	
		The Lybian civil war was largely a two dimensional conflict	Primarily a geographically; Primarily a conflict between the peoples of the east (Cyrenica) and the west (Tripoli) east-west conflict	Knowledge	
		The West was comfortable with the ideology of the opposition Libya.	Not so in Syria	Information	
4	How the War in Syria is Different from that in Egypt	Massive opposition to Mubarak was immediate, universal, and overwhelming	Opposition to Assad grew gradually, and had different various origins.	Information	
		The struggle to depose Mubarak was without a sectarian angle	Syria's conflict has sectarian overtones which have implications across the region.	Information	
		In Egypt, the Army was there to take power after Mubarak was removed	If Assad regime falls, it is not clear who/what will fill the power vacuum.	Information	
		Mubarak demonstrated relative restraint against civilian population	The Assad regime has demonstrated that it is willing to use lethal force against its own people	Information	
5		Ethnic Groups: (1) Indigenous Levantine people	Form the majority of citizens as they are 26 million in Syria	Information	
		(2) Kurds are spread out over southwest Asia	5% are found in Syria	Information	
		(3) The other ethnic groups	Those who originated from neighboring countries	Information	
6		Religion: (1) Sunni Muslim (Islam - Official)	Islam is the official religion of Syria with 74% of the population	Information	
		(2) Other Muslim	(Includes Alawite, Druz) are 16%	Information	
7	Key Political Actors and Interest Groups	Ethnic Distribution Map of Syria	Sunni, Alawi, Christian, Druz, Yezidi	Information	
7		Influential Individuals: (1) President Bashar Assad	The most powerful individual in the Syrian government having ruled the country since 2000	Information	
		(2) Maher Assad	Is Bashar's brother and commands the republican guard which is the best equipped army	Information	
		(3) Mr. Rami Mahklouf	Is arguably the most powerful economically	Information	
		(4) Abdul Fatah	Is the deputy director of the NSB	Information	
8			Political Parties: (1) Arab Socialist Baath Party	The predominant and the ruling party since 1963;	Information
			(2) Syrian Communist Party	In the last election it got 8 MPs and was publishing	Information
9			Key Syrian Leaders (pictures)	Maher Assad, Bashar Assad, Ali Mamluk	Data
10			Kerry and Assad (pictures)		Data
			Militias: (1) Shibiha Militias	Pro-government armed civilians who fight rebels and the U.S. categorizes them as a terrorist group and spies for government	Information
	(2) The all-female militias of Syria		Specifically trained by the government to protect it against the rebels	Information	
	(3) Jabhat al Nusra		Militia affiliated with AQ - trying to oust Assad	Information	
	Civil Society Institutions: (1) The People's Revolt		One of the most vocal civil society movements which blew the whistle for the Syrian revolt	Information	
11		(2) Nabd	Is a very profound movement that advocates for non-violence and seeks to unite different tribes	Information	
		Private Sector: (1) Syrian economy mainly relies on Oil and Agriculture	This reliance boosted the economy before the current rebellion. Much of the oil is explored by the private sector hence the need to streamline it	Information	
12	Foreign Fighters	(2) 75% of the land is privately owned	Government has to take key steps to promote agribusiness	Information	
		Al Nusra Front (Jabhat al Nusra)	In early 2012, Al Qaeda in Iraq (AQI), created this branch in Syria. In December 2012, the Obama Administration designated Al Nusra Front as a Foreign Terrorist Organization	Information	
		Islamic State of Iraq and Sham (ISIS)	Al Nusra backers split into two factions: one group maintained its original name while Abu Bakr al Baghdadi, the leader of AQI, transformed the other faction into a new group (ISIS)	Information	
		Syrian Islamic Front (SIF), the Saquour al Sham brigades, the Abdullah Azzam Brigades, the Ummah Brigade (Liwa al Umma), and the Islam Brigade (Liwa al Islam)	These are other prominent armed Salafist groups	Information	

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
13	Opposition Players in Syria	(1) Syrian National Council (SNC); (2) Free Syrian Army; (3) Muslim Brotherhood		Data
14	[Graphic Depiction] Syria: Crisis and Competing Interests	Two big arrows colliding	One the one side is the Syrian National Coalition, Free Syrian Army with Super Powers (U.S. & Europe), Regional Powers (Saudi Arabia, Turkey, Israel, the Arab League, Qatar, and Jordan); On the other side is the Assad Government with Super Power (Russia), Regional Powers (Iran, Iraq, Hezbollah, and Hamas)	Knowledge
15	Syrian National Council (SNC)	(1) The SNC was founded in October 2011 and is composed of seven groups outside of Syria	It seeks to serve as a single point of contact for the international community. Their goals are (1) overthrow the regime using all legal means; (2) Affirm national unity and reject ethnic strife; and (3) protect national independence and sovereignty, and reject foreign military intervention	Information
		(2) In March 2012, the SNC created a military bureau	To coordinate armed anti-government groups in Syria. The FSA said it would not cooperate with the	Knowledge
		(3) The SNC is dominated by Syria's majority Sunnis	It has not attracted much support from Christians or Alawites	Information
		(4) The SNC is not yet as credible as Libya's NTC, but int'l community still interested		Information
16	Free Syrian Army	(1) The Free Syrian Army (FSA) was formed in August 2011 by army deserters based in Turkey	The FSA says it wants to: (1) topple the regime; (2) protect the country's resources; and (3) stand up to the Syrian army which supports the Assad regime	Information
		(2) The FSA claims to have 15,000 fighters, but may have less		Data
		(3) Analysts say that the FSA is not longer only deserters	They have become an umbrella group for civilians	Information
		(4) The UN Human Rights Council said it had documented human rights abuses committed by the FSA	The FSA said field commanders made independent decisions	Information
		(5) The FSA and SNC have found it difficult to work together		Data
17	Muslim Brotherhood	Riyadh Shaqfeh and Muhammad Badie	There is a link to a youtube video about the history	Understanding
18	Key Realities for the Opposition and International Community	The opposition will likely never accept the "hard sell" expected from the regime:	Rule by the same president, the same family and security services	Understanding
		The exiled opposition - the SNC - has so far proved	The SNC has almost become an asset to the Assad	Knowledge
		The opposition is now more of an "irritant" than a	Reason is due to the regime regaining control of	Understanding
		The economy's slow collapse will not drive the regime to	The regime is only interested in its own survival	Understanding
19	Possible Link Between Regime and Opposition	As the regime systematically targets opposition strongholds, the opposition will adopt new methods too: guerrilla warfare, and an "insurgency/counter-insurgency" cycle will begin.	This will make it increasingly difficult to create a space for peaceful protest	Understanding
		As the opposition splits between "popular movement"	(1) The armed opposition will become more	Understanding
20	Unrealistic Expectations on all Sides	In Syria:	(1) the regime wants the opposition to surrender; (2) Many Syrians bank on international intervention; (3) Some think Russia and the West will go through a rapprochement; (4) Some think the opposition will be eradicated, and the former status quo will return	Knowledge
		Russia and China:	(1) driven by their aversion to popular protests, and Western intervention, they will hope that Assad somehow calms things, whether through military or domestic political means. Russia realizes that its continued relevance depends on its continued role as maverick	Knowledge
		The West is hoping the violence will disappear	(whether through Tahrir-like demonstrations;	Knowledge

Source: Created by author.

Group 3 (Satellite) organized the presentation into six parts, according to the PMESII framework, over 16 slides (see table 6). Sixteen students contributed to this presentation. This group used eight class hours and had one day to complete the assignment. There are 851 words in the presentation. No visual model is used in the presentation. Additionally, no references or citations are included.

For the first element of the framework, the political environment, this group explains both the internal and external political actors. For the internal political environment, the Assad regime is listed as being supported by the Alawite Shiites and Hezbollah. Al Qaeda and Associated Movements is grouped with the Abdullah Azzam Brigade, the Islamic State of Iraq and the Levant and the Pakistani Taliban. This group depicts the armed opposition being composed of the Kurds as well as an umbrella group, the Supreme Joint Military Command. Under this command are the Free Syrian Army, Syrian Liberation Front, Syrian Islamic Front, and Independent brigade alliances. In the next slide, this group provides knowledge about six external political actors: Russia, Turkey, France/United Kingdom, Lebanon, and Israel.

On slide six Group 3 (Satellite) provides very detailed material about the external military environment, discussing the capabilities, potential courses of actions, and impacts of four actors: Iraq, Jordan, Turkey, and the Gulf States. Slide seven describes the internal military environment of Syria. This group details the capabilities of four actors: the Government of Syria, Hezbollah, Iran (described as providing support to the Assad regime), and militias. Slide eight is a situational template map of Syria, showing areas of government strength, rebel strength, and contested areas.

Slides nine and 10 depict the internal economic environment of Syria. Group 3 (Satellite) provides information about the strengths, weaknesses, key industries, key economic supporters, and additional pressure points on Syria's economy. The map on slide 10 depicts where oil and gas fields are located in Syria. As a prompt for discussing the internal social environment of Syria, this group uses a map of the rebel activity in Syria. Slides 12 and 13 explain the internal social environment of Syria. This group discusses the key ethnic and religious groups in Syria: the Arab Alawite, Christian, Arab Sunni, and Kurdish Sunni. Group 3 (Satellite) describes the Salafi movement and highlights where each ethnic and religious group resides in Syria.

Slide 14 describes the regional and international information environment. On this slide, Group 3 (Satellite) explains the focus of Al Jazeera, Al Arabia, and the Syrian state media. They explain the international information environment by focusing on the way the Syrian conflict is portrayed by the international and U.S. media outlets. On slides 15 and 16, this group provides material on the final component of the PMESII framework, the infrastructure environment. Using a small map of Syria, Group 3 (Satellite) show the locations of the sea ports and airports of debarkation. This group also highlights key cities in Syria. This group then locates military bases in Syria, describing nine critical locations.

The final topic this group covers on slide 16 is the locations of possible chemical storage sites. This group notes that there are approximately five locations in key cities in Syria, located near military bases, which have lift and transport capabilities. This group notes that the inability of the United States to control these storage and delivery systems could allow extremists to gain better access.

Table 6. Assessment of Group 3's (Satellite) PowerPoint Presentation

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
1	Title Slide	Joint Operations Planning Process 2013		
2	Agenda Slide			
3	Map of Syria	From Google Earth		
4	[Graphic Depiction] Internal Political Environment	Structure of the Armed Opposition: There is an Umbrella Group (named the Supreme Joint Military Command) which has the FSA, SLF, SIF, and Independent Brigades alliances	Kurds seek autonomy and protection and clash with Islamist fighters. They tacitly support the Syrian Islamic Front	Knowledge
			Free Syrian Army falls under the Umbrella Group - Supreme Joint Military Command - and has 50,000 fighters and an unknown number of brigades	Knowledge
			Syrian Liberation Front (SLF) falls under the Umbrella Group and has 37,000 fighters and 20 brigades	Knowledge
			Syrian Islamic Front (SIF) falls under the Umbrella Group and has 13,000 fighters and 11 brigades	Knowledge
			Independent brigade alliances (approximately 9) have an unknown number of fighters and independent battalions	Knowledge
			Shia Group fighting the Armed Opposition	Assad regime supporters are Alawite Shiites Hezbollah supports Assad and defends Shia holy sites
		Sunni Group aligned with AQAM fighting against the Assad government	Sunni group Jabhat al-Nusra has 6,000 fighters	Information
			Sunni group Abdullah Azzam Brigade (AAB) wants to overthrow Assad and establish Caliphate and are associated with Al-Qaeda and Associated Movements (AQAM)	Information
			Sunni group the Islamic State of Iraq & the Levant (ISIL) is associated with AQAM	Information
			Sunni group Pakistani Taliban (TTP), Tehrik-e-Taliban Pakistan is associated with AQAM	Information
5	External Political Environment	Russia	(1) Primary obstacle to international intervention; (2) Prevent "NATO LIBYA"; (3) Sole Mediterranean naval port located in Syria; (4) Significant investment in Syria (approximately 19bn annually)	Knowledge
		Turkey	(1) Strategic location; proximity threatens economy; (2) Syria crisis boosts Turkish internal peace process; (3) Backed away from initial Syrian opposition support	Knowledge
		France/UK	(1) Primary actors leading international call for intervention; (2) Pres. Hollande acting as primary LNO to Syrian National Coalition; (3) Deep French ties due to occupation (1920-1946); (4) France favors Political/NGO resolution	Knowledge
		Lebanon	(1) Syrian war threatens current economic and political recovery; (2) Shia Hezbollah vs. Sunni	Knowledge
		Israel	(1) Historical enemy since creation of states; (2) Recent airstrikes focused on preventing weapon shipments	Knowledge
6	External Military Environment	Israel	Capacity: ISR (Predator Class and Below; F-16/Rotary (US FMS); ADA Patriot; Long range Strike Capable; Space assets (with US Support); Green Sea Navy; Nuclear Capable; Potential COAs: Most likely conduct long range strike to protect IS border; Impacts: Forces US involvement because of Partnership - stresses regional balance and alliances	Understanding
		Jordan	Capacity: Strong defensive army - British Based mechanized infantry; Challengers and Howitzers F-16s; ADA Hawk and Patriot; Potential COAs Mass soldiers and assets along Syrian border to prevent Chemical Weapon Proliferation and infiltration of insurgents and Protect the Kingdom of Jordan; Impacts: Forces US involvement because of Partnership	Understanding
		Turkey	Capacity: NATO capabilities - Leopard Tanks; F-16C/Rotary (US); ADA Patriot; Long range Strike Capable; Space assets (with US Support); Green Sea Navy; Potential COAs: Mass soldiers and assets along Syrian border to prevent the spread Kurdistan workers Party-Terrorist org. exploiting opportunity and criminality; Impacts: Turkey-Russia-US dynamic and regional balance	Understanding
		Gulf States	Capability: US-Like primary FMS customer ISR (Predator Class and Below); F-16/Rotary (US); ADA Patriot; Long range Strike Capable; Space assets (with US Support); Potential COAs: prevention of spread of conflict beyond Syrian Border, destabilization of region and spread of Iranian influence (i.e., Hezbollah); Impacts: Increased focus on Iranian and Russian support which counters GCC support to rebel Sunni forces	Understanding

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
7	Internal Military Environment	GOS	(1) Functional air, ground, and naval forces; (2) Personnel strength: 295k active, 314k reserve; (3) Dated equipment with few spare parts of maintenance capability; (4) inherited Soviet top-down, take-no-initiative style warfare; (5) Rely heavily on Iranian aerial resupply	Understanding
		Hezbollah	Approximately 50k pro-Assad militia fighters from Lebanon and Iran; (2) Lack training, not commitment	Knowledge
		Iran	(1) Provides essential military supplies, intelligence, and training; (2) Regular forces deployed ISO Assad regime	Knowledge
		Militias	(1) Free Syrian Army (50k), Syrian Liberation Front (37k), Syrian Islamic Front(13k); (2) Supreme Joint Military Command Council provides nominal MC; (3) Rely on non-state sponsors for sustainment	Knowledge
8	Situation Template	Map of Syria	Shows areas of gov't strength, rebel strength, contested areas, historically Kurdish areas, and official refugee camps.	Information
9	Economic Environment	Strengths:	subsidies (fuel, bread, medical, education)	Information
		Weaknesses:	Inflation, GDP 35%, foreign trade 97%, unemployment x4	Information
		Key Industries:	oil production, agriculture, tourism	Information
		Key Economic Supporters:	China, Russia, Iran - Possible pressure points	Information
		Additional Pressure Points:	fuel (shortage, domestic cost); price of basic commodities	Information
10	Map of Syria	Oil and gasfields in Syria		Information
11	Map of Syria	Rebel Activity in Syria (as of March 8, 2013)	Areas of armed rebel activity; territorial control by city [included are the FSA and allies, Kurdish militias; Gov't; and Divided	Knowledge
12	Social Environment	[Key Actors] Ethnic Religious Groups:	Arab Alawite (Bashir al-Assad, 12%); Syrian Gov't/Army; Islam Shia, Conservative; Believe Survival is linked to Syrian gov't	Knowledge
			Christian (10%); Neutral to Pro Gov't; Believe survival linked to Gov't	Knowledge
			Arab Sunni (60%); Free Syrian Army; Regime Change; Autonomous moderate Syria	Knowledge
			Kurdish Sunni (9%); Free Syrian Army; Political Autonomy; Western Kurdistan, Eastern Syria	Knowledge
13	Social Environment	Customs/Social Conventions:	Salafi: (1) movement in late 19th century; (2) Well educated in Western Europe; (3) Opposed to conservative interpretation of religion/law; modernistic and secular; (4) members were founders of Syrian Muslim Brotherhood	Knowledge
			Geography: (1) Alawite (Western Syria - 80% of the Syrian gov't; (2) Christians (Damascus, Aleppo); (3) Kurds (North Eastern Syria, "Kurdistan"); (4) Arab Sunni (Geographically dispersed); (5) Battalions (Kurds, Turkmen, Palestinians, Druze)	Information
14	Information Environment	Regional	(1) Aljezeera focused youth discontent; (2) Aljezeera sectarian infighting greater issue than regime vs. rebels and establishing Syrian independence; (3) Al Arabia focused on identifying actos of reconciliation between military and rebels; (4) Syrian state media declares victory in Homs	Information
		International	(1) Media progressives, support "activist" propaganda against Syrian State (INT); (2) Russia in media crossfire over Syria (US); (3) Civilian Casualties (INT)	Information
15	Infrastructure Environment	SPODS	Major ports along the Mediterranean Sea are adequate for loading/offloading operations	Information
		APODs	Two major primary locations (mazzeh & Damascus) with fixed-wing capabilities	Information
		Key Cities	(1) Although the Assad regime has prevented insurgents from seizing key cities - such as Damascus, Aleppo, and Homs - it has been unable to dislodge them from these areas; (2) Insurgents progress could lead to a more permanent base for insurgent operations throughout rural areas as well	Information
16	Infrastructure Environment	Military Bases	(1) Nine critical locations, three of which are in the city of Damascus; (2) Approximately 21 others sporadically located along all fronts; (3) Naval bases are capable of supporting coastal patrol craft, submarines, etc.	Knowledge
		Possible Chemical Storage Sites	(1) Approximately five locations in key cities such as Al-Safira (scud missile), Hama (scud missile), Homs, Latakia, and Palmyra; (2) Locations are in conjunction with key military bases with lift and transport capabilities; (3) Our inability to fully control Syria's storage and delivery systems could allow extremists to gain better access	Understanding

Source: Created by author.

Group 4 (Common Core) is unique compared to the previous three CGSOC groups, because much of the work was completed on and briefed from a white board. Therefore, this group did not include this material in the PowerPoint presentation, though two pictures capture all of the group's board work. Group 4's (Common Core) PowerPoint presentation is a summary of the salient points that emerged during the brainstorming session and is only five slides in length (see table 7). Sixteen students contributed to this presentation. This group used six class hours and had one day to complete the assignment. There are 1,018 words used, which includes the presentation, board work, and visual model. No references or citations are included.

On the board, Group 4 (Common Core) used the PMESII-PT framework to describe the Syrian conflict. Most of the material listed under each operational variable is composed of only single words and not complete sentences. Thus, most of this material is assessed as either data or information due to the lack of depth. Most of the depth is found in the visual model and PowerPoint presentation. A digital copy of this visual model is shown in Figure 7. This group uses 37 nodes and 19 links to depict the systems present inside and outside of Syria as well as the relationships between the elements of these systems respectively. Most of the emphasis of this visual model is on outside influences on the Syrian conflict.

The PowerPoint presentation follows the Army Design Methodology framework: the current situation; desired end state; the problem statement; the commander's intent; and the lines of effort to achieve the desired end state. This group states the conflict is primarily between the government forces, led by the Alawite minority, and the rebel forces, which are primarily Sunni. Also, this group identifies international actors

supporting both the government and rebel forces (e.g., Russia and Iran as pro-regime and the United States and United Kingdom as pro-rebel). This group suggests the primary means to achieve the desired end state is to remove the Assad Regime and to institute a government which represents all sides peacefully. This group lists five lines of effort to achieve the desired end state: to disable the Assad Regime; enable rebel forces; establish a civil authority; disassociate the military from Assad; marginalize non-state actors; and align international support.

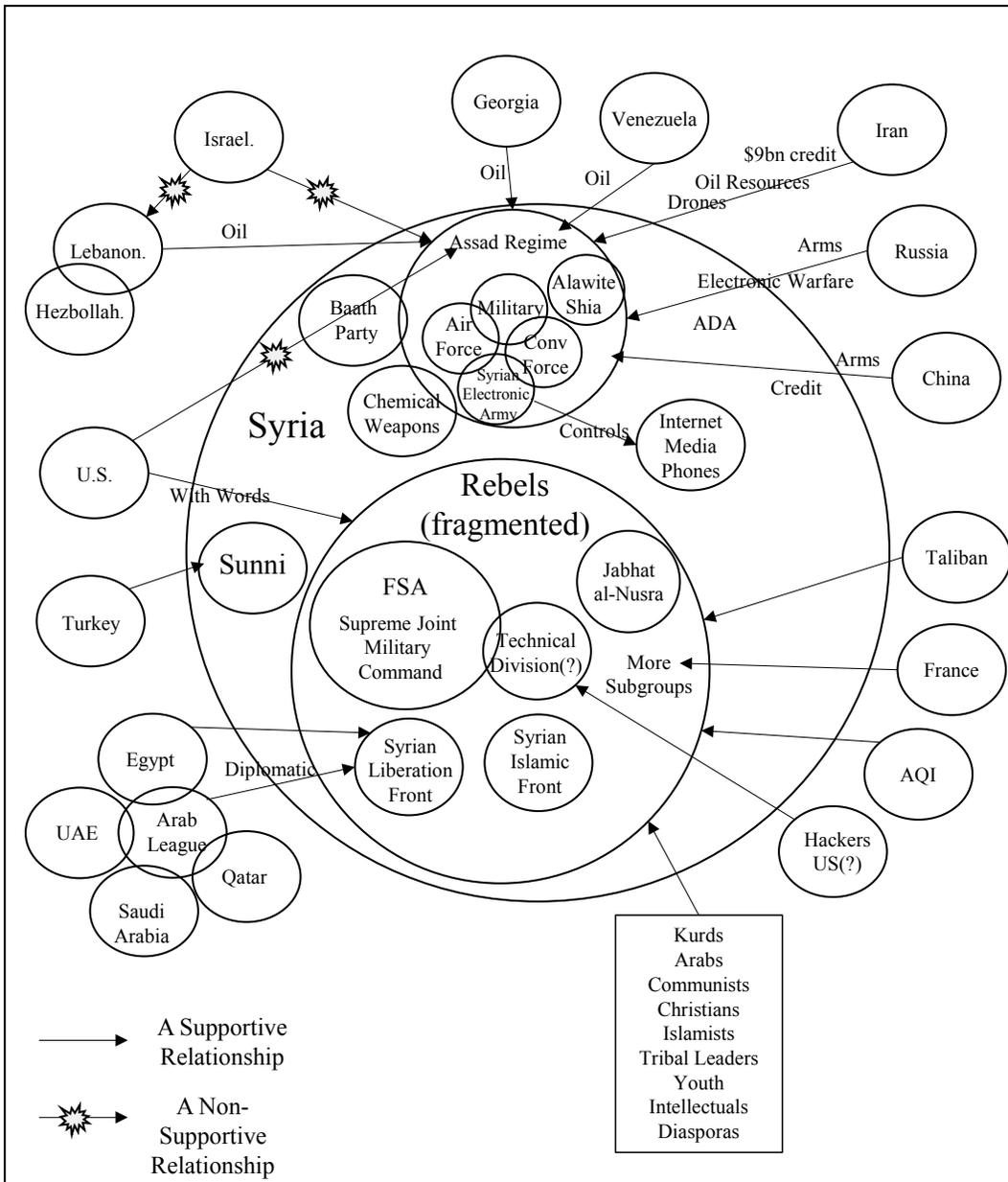


Figure 7. Group 4's (Common Core) Visual Model of the Syrian Conflict

Source: Created by author using information from Group 4's (Common Core) whiteboard work, U.S. Army Command and General Staff College, Fort Leavenworth, KS, Fall 2014.

Table 7. Assessment of Group 4's (Common Core) PowerPoint Presentation

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
Info from White Board	Political	Supreme Joint Military Command (General Salim Idris)		Data
		Hasi Leader [Hassan Abud] - SIF		Information
		Religious Affiliation		Data
	Military	15-49 years		Data
		WMD		Data
		Broad Weapon Inventory		Data
		ABN, AR, SF, ADA, Navy		Data
		Immature Logistics Pipeline		Information
		Defectors		Data
		Economic	Relies on Lebanon	
	Increase exports to Iran			Information
	Iran has given Syria a \$4B in credit			Information
	Still receiving oil via private firms from Georgia and Lebanon			Information
	Increase instability due to drought, outside economic crises			Information
	Decrease in E&I = Decrease in GDP			Information
	China has given Syria credit?			Information
	Social Environment	40% of country in middle class		Data
		Religious Affiliations: FSA - Sunni; Gov't - Shia		Information
		10.6 million (85%) Islamic		Data
		69% Sunni		Data
		15% Arab		Data
		Less than 1% Shia		Data
		10% Christian		Data
		Approximately 3% Druze		Data
		90% Arabic, Kurdish, Armenian, French, English		Data
		60% Literacy rate		Data
		Capital is Damascus		Data
		Gained Independence 17 April 1946		Data
		Tribes account for less than 7% and is decreasing		Data
	Many Syrians are fleeing to Iraq as refugees		Information	
	Information	Internet black outs connect to gov't aims		Information
		C4 capable Gov't		Knowledge
		Rebels have immature communication capabilities		Knowledge
		Gov't Intel capabilities (EW, WAS, Collection)		Information
		Rebels have cyber capability		Information
		Gov't has the Syrian Electronic Army		Information
		Gov't owns the communications infrastructure and media outlets		Information
	Infrastructure	11B BDA to country		Data
		Allepo, Damascus, Homs are dense population centers		Data
		Water dependent (hydro and irrigation)		Data
		56% urban		Data
		104 Airports		Data
Gov't rail system			Data	
Major road system			Data	
Robust SPODs			Information	
State-run Life support			Data	
Export oils and gas 400k/day			Information	

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved	
Info from White Board	Physical Environment	There is a concentration of services and facilities in the northwest portion of Syria		Information	
		The Shiite minority mainly live near Homs		Information	
		The major cities are aligned north to south (Aleppo, Homs, Damascus respectively)		Information	
		The Euphrates runs along the eastern part of the country (used for hydro and irrigation purposes)		Information	
		Oil and Natural Gas is located in south east portion of Syria		Information	
		Kurds live mainly in the northeast portion of the country		Information	
		The Sunni majority live throughout the middle of the country		Information	
	[Graphic Depiction] Systems Overview of Syrian Civil War	Internal Issues		The Assad Regime has the ability to use chemical weapons	Information
				The SEA controls the internet, media, and phones	Knowledge
				The Assad regime has an Airforce that is 60-70 percent capable	Knowledge
		Rebel Forces		The Opposition is fragmented	Information
				The FSA started the Supreme Joint Military Command	Information
		International Influence		Georgia is interested in Syria's oil	Information
				Venezuela is interested in Syria's oil	Information
				Iran has supported the Assad regime with drones, oil resources, and \$9bn in credit	Information
				Russia has supported the Assad regime with arms, electronic warfare capabilities, and ADA	Knowledge
				China has given arms and credit to the Assad regime	Knowledge
				the Taliban supports rebel factions	Information
				France supports some of the subgroups in the opposition	Information
				Hackers (possibly from the U.S.) support the technical divisions of the FSA	Knowledge
				The Arab League has given diplomatic support to the Syrian Liberation Front	Knowledge
				Egypt supports the SLF	Information
				Turkey supports the Sunni population in Syria	Information
				The U.S. has denounced the Assad regime and has supported the rebel factions with words	Knowledge
				Lebanon and Hezbollah support the Assad regime	Information
				Numerous outther groups are supporting the rebels: the Kurds, Arabs, Communists, Christians, Islamists, Tribal leaders, Youth, Intellectuals, and Diasporas	Information
		1 Current State		Since 2011, ninety-thousand Syrian citizens have been killed during a civil war in Syria.	Conflict erupted between the two opposing forces due to ethnic/political marginalization, economic disparity, and sectarianism.
	The principle actors in the conflict:		the Pro-Assad Regime and the Rebel Forces (Free Syria Army). Additional principle actors include religious groups, ethnic groups, and international actors.	Knowledge	
	The two opposing forces are aligned primarily along sectarian lines.		Shia sects, led by the Alawite minority, are the principle supporters of the Assad regime. Sunni sects are the principle supporters of the Rebel Forces. Approximately eighty-five percent of the Syrian population are Sunni Muslims; approximately thirteen percent of the population belong to Shia sects. The majority of the Sunni population has aligned with the rebel forces.	Knowledge	
	Pro-Rebel International Actors (i.e. U.S., U.K., Arab League) provide support to the Rebel Forces due to ideological ties.			Knowledge	
	Pro-Regime International Actors (i.e. Russia, Iran and Lebanese Hezbollah) provide support to the regime due to ideological ties, access to resources and strategic ports.			Knowledge	

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
2	Desired End State	Syrian society is stabilized and its interests are placed above the interests of other principal actors.	Sunni, Shia and other minority interests are all represented peacefully.	Knowledge
		The Assad Regime is replaced by a stable government that provides leadership, direction and control to the military and society.		Knowledge
		The military provides security to the Syrian people by denying sanctuary and legitimacy to non-state actors/terrorists.		Knowledge
		These changes have legitimized the Syrian government in the eyes of the international community and democratic world powers.		Knowledge
		The new Syrian government has a positive economic relationship with the international community including China and Russia, and negative effects/influences from non-aligned nations and non-state actors are minimized.		Knowledge
3	Problem Statement	There is an ongoing civil war in Syria.	Rebel forces have limited capabilities to overthrow the Assad regime. International actors (Russia, China) and non-state actors (AQ, Hezbollah) are providing support, in the form of weapons, equipment, money and fighters to the Assad regime. Underlying sectarian divisions will hinder the establishment of a stable post-regime government.	Understanding
4	Initial Cdr's Intent	<p>The purpose of this operation is to create a stable post-regime government in Syria.</p> <p>Key Tasks: U.S. CYBERCOM conduct CNO IOT disable the Assad regime U.S. military enables rebel forces U.S. State Department, ICW the U.S. Military, establish MJCP as civil authority CIA conducts covert actions to disassociate Syrian military from the Assad regime State Department aligns international support while concurrently marginalizing non-state actor influence</p> <p>The end-state of the operation is the establishment of the post-Assad government, an inclusive and peaceful Syrian society, a military capable of supporting the established government, and a supportive international community</p>		Knowledge
5	Operational Approach (LOOs and End States)	<p>Lines of Effort: (1) Disable Assad Regime</p> <p>(2) Enable rebel forces;</p> <p>(3) Once 1/2 are complete, establish a post-Assad Gov't</p> <p>(4) Establish MJCP as Civil Authority to ensure Syrian society is inclusive</p> <p>(5) Disassociate military from Assad to establish a military capable of supporting the established gov't</p> <p>(6) Marginalize non-state actors</p> <p>(7) Align international support in coordination with (6) to get the international community to be supportive of established government</p>		Knowledge

Source: Created by author.

Group 5 (LDW) organized the presentation into four parts, over 32 slides (see table 8). Seven students contributed to this presentation. This group used 16 class hours

and four days to complete the assignment. There are 1,636 words in the presentation. Throughout the presentation, this group uses seven visual models to explain various aspects of the complexity. Additionally, this group references 15 different sources.

The first part, which consists of seven slides, is this group's systems perspective of the Syrian conflict. The actual visual model from the presentation is shown in figure 8. This group uses 61 nodes and 99 links to depict the systems present inside and outside of Syria as well as the relationships between the elements of these systems respectively. The intent of these slides is to provide an overview of the complexity of the Syrian conflict.

In part two, which consists of 13 slides, this group describes Craig Parsons's casual logics, used to explain how the Syrian civil war can be either short or long using a negotiated settlement or not, how a fragmented opposition as well as foreign intervention can lead to a longer war. This group discusses additional variables to help describe the conflict, such as: the effectiveness of rebel governance; the presence of foreign fighters; the structure of armed groups; ability for authoritarian regimes to adapt; and national-building and path dependence. There are seven hidden slides which provide more in-depth material covering the four casual logics: structural, institutional, ideational, and psychological. Some of the material is similar to other material in the presentation and therefore this material is not assessed. Within this section, Group 5 (LDW) uses 13 different references to aid in achieving an understanding of the operational environment.

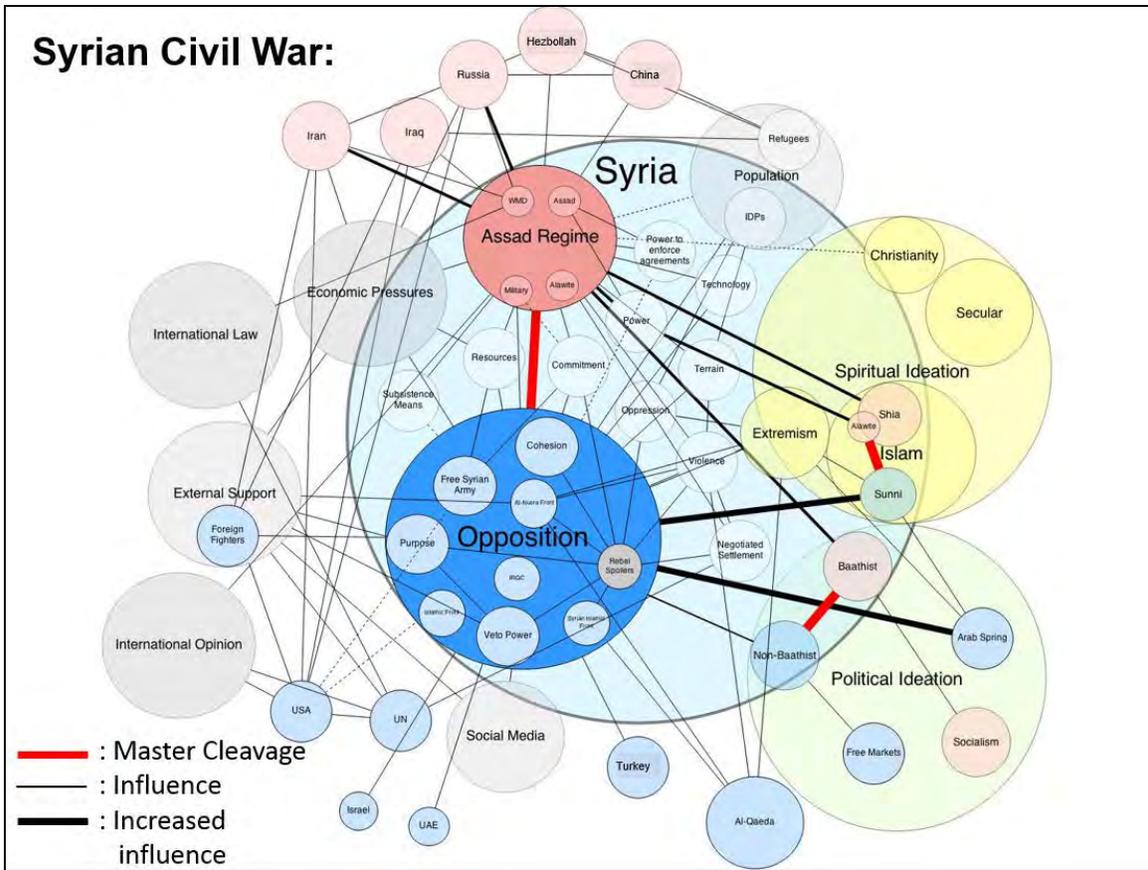


Figure 8. Group 5's (LDW) Visual Model of the Syrian Conflict

Source: Group 5 (LDW), PowerPoint Presentation, U.S. Army Command and General Staff College, Fort Leavenworth, KS, January 2014.

In the third part, Group 5 (LDW) explains the interactions of the systems' elements described in the first part and uses a visual model to explain how actions in the operational environment can move the situation toward either regime or opposition victory. For example, the opposition tries to provide services and stability which causes the regime to conduct indiscriminate attacks to undermine that effort. However, when the regime conducts indiscriminate attacks, the situation will move slightly toward opposition victory. Yet, this depends on the opposition. If the opposition begins to

fragment, then the situation could move toward regime victory. If the opposition unites, then it could continue to move the situation toward opposition victory.

In the fourth part, Group 5 (LDW) describes three possible intervention strategies, under the heading of Current Potentialities, with corresponding outcomes. Additionally, this group speculates four specific temporal and situational areas where the United States could have taken experimental action to influence events in Syria to achieve more positive strategic outcomes. This group explains the relationship between the United States and Syria from the 1970s through 2014 using a timeline graphic (see figure 6) and explains the current state of affairs. This group then explains the United States has three possible intervention strategies: to support the rebels; attack the regime; or support a negotiated settlement. In the first, the outcome would be a regime change. Yet, the difficulty is who is chosen to fill the power vacuum: would it be the “good rebels” or the “bad rebels”? In the second option, if the regime is removed, then there is the possibility of a proxy war between the “good rebels,” supported by the United States, and the “bad rebels,” supported by Russia and Iran. In the third option, if a settlement is supported, then the “bad rebels” could disrupt the process and the situation would not change.

In the first visual model depicting experimental action, this group states since the 1990s, the United States should have strengthened Syria’s place in the international community to create a broader sphere of interest. In the second visual model, which could have started in 2001, the United States should have fostered a capable constituency. In other words, the United States could have helped Syria develop a more stable government. This would have improved Syria’s resistance to terrorism. In the third visual model, which could have started in 2011, the United States should have persuaded or

coerced the Assad regime to change destructive policies to prevent uprisings. In the final experimental intervention, which could have started in 2001 and lasted until 2012, the United States could have used military force to change the regime with the goal of preventing a civil war.

Table 8. Assessment of Group 5's (LDW) PowerPoint Presentation

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved		
1	Title Slide	"The Syrian Civil War: An Analysis of Complexity"	Labeling conflict a civil war	Knowledge		
2	Agenda Slide	Ethnic Map of Syria	Location of ethnic groups in Syria	Information		
3-4	[Graphic Depiction] Systems Overview of Syrian Civil War	Assad Regime	Opposition (master cleavage); Power (increased influence); Technology; Terrain; Violence; Economic Pressures; Population (tacit relationship); Subsistence means; Shia Islam (increased influence); Christianity (tacit relationship); Baathits (increased influence)	Knowledge		
		(1) Weapons of Mass Destruction	Within the Assad regime	Knowledge		
		(2) Assad	Within the Assad regime	Knowledge		
		(3) Alawite	Within the Assad regime; Power	Knowledge		
		(4) Military	Within the Assad regime; Resources; Opposition	Knowledge		
		Opposition	Economic Pressures; Resources; Assad Regime; Subsistence Means (tacit influence); Population; Technology; Terrain; Violence; Extremism; Sunni (Increased Influence); Arab Spring (Increased Influence); Non-Baathist; Social media	Knowledge		
		(1) Free Syrian Army	Within the Opposition; Resources	Information		
		(2) Purpose	Within the Opposition	Information		
		(3) Al Nusra Front	Within the Opposition; Extremism; Violence	Knowledge		
		(4) IRGC	Within the Opposition	Information		
		(5) Islamic Front	Within the Opposition	Information		
		(6) Syrian Islamic Front	Within the Opposition	Information		
		5	[Graphic Depiction] Systems Overview of Syrian Civil War	Power	Assad Regime (increased influence); Assad; Alawite (increased influence)	Knowledge
				Technology	Assad Regime; Opposition	Knowledge
Terrain	Population; Assad Regime; Opposition; Violence			Knowledge		
Oppression	Population; Extremism			Knowledge		
Violence	Terrain; Al-Nusra Front; Opposition; Extremism (increased influence); Assad Regime			Knowledge		
External/Internal social media	Already included in Opposition					
6	[Graphic Depiction] Systems Overview of Syrian Civil War	External/Internal Economic Pressures	Assad Regime; Resources; Opposition	Knowledge		
		Population (External/Internal)	Assad Regime (tacit relationship); Opposition; Oppression; Terrain; Spiritual Ideation	Knowledge		
		(1) Refugees (external)	Within Population (external to Syria)	Information		
		(2) Internally Displaced Persons (IDPs)	Within Population	Information		
		Subsistence Means	Assad Regime; Opposition (weak relationship)	Knowledge		
		Resources	Economic Pressure; Assad Regime; Free Syrian Army; Opposition	Knowledge		
		Spiritual Ideation (Internal/External to Syria)	Population	Information		
		(1) Christianity	Assad Regime (tacit relationship)			
		(2) Secular	Within Spiritual Ideation	Information		
		(3) Islam	Within Spiritual Ideation	Information		
7	[Graphic Depiction] Systems Overview of Syrian Civil War	(a) Shia	Within Islam/Spiritual Ideation; Assad Regime (increased influence); partly connected to Alawite	Knowledge		
		(b) Alawite (external/internal to Shias)	Within Islam/Spiritual Ideation; partly connected to Shia; Power (increased influence); Sunni (master cleavage)	Knowledge		
		(c) Sunni	Within Islam/Spiritual Ideation; Alawite (master cleavage); Opposition (increased influence); Extremism	Knowledge		
		(d) Extremism (External/Internal to Spiritual Ideation)	Oppression; Al Nusra Front; Violence; Opposition; Sunni; Arab Spring	Knowledge		
		Political Ideation (External/Internal)	Contains Baathist, Non-Baathist, Free Markets, Socialism, and Arab Spring	Knowledge		
		(1) Baathist (Internal)	Within Political Ideation; Assad Regime (increased influence); Non-Baathist (master cleavage); Socialism	Knowledge		
		(2) Non-Baathits (Internal/External)	Within Political Ideation; Opposition; Baathist (master cleavage); Free Markets	Knowledge		
		(3) Free Markets (External)	Within Political Ideation; Non-Baathist	Information		
		(4) Socialism (External)	Within Political Ideation; Baathist	Information		
		(5) Arab Spring (External)	Within Political Ideation; Opposition (increased influence); Extremism; Sunni	Knowledge		

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
8	[Graphic Depiction] Systems Overview of Syrian Civil War	Al-Qaeda (External)	Extremism; Violence; Al Nusra Front; Opposition	Knowledge
		Turkey	Opposition	Information
		UAE	Opposition	Information
		Israel	Opposition	Information
		UN	International Law; External Support; International Opinion; USA	Knowledge
		USA	International Opinion; External Support; Iran; Iraq; Russia; Free Syrian Army (weak influence); Opposition (weak influence); UN	Knowledge
		International Opinion	Assad Regime; UN; USA	Knowledge
		External Support	Economic Pressures (External); Al Nusra Front; Purpose (in Opposition); Social Media; UN; USA	Knowledge
		(1) Foreign Fighters	Within External Support; Iran; Iraq; Opposition	Knowledge
		International Law	WMD; UN	Knowledge
		Iran	Foreign Fighters; USA; Economic Pressure; Assad Regime (increased influence); WMD; Russia	Knowledge
		Iraq	Foreign Fighters; USA; Assad Regime; Syrian Refugees	Knowledge
		Russia	Iran; Economic Pressure; USA; WMD; Assad Regime (increased influence); China; Hezbollah	Knowledge
		Hezbollah	Russia; China; Refugees	Knowledge
China	Hezbollah, Russia; Assad Regime; Refugees	Knowledge		
9	[Graphic Depiction] Systems Overview of Syrian Civil War	Power to enforce agreements	Assad; Assad Regime; Opposition (weak relationship)	Knowledge
		Commitment	Assad Regime; Military (weak relationship); Free Syrian Army; Opposition; Rebel Spoilers	Knowledge
		Cohesion (within Opposition)	Rebel Spoilers	Information
		Rebel Spoilers (within Opposition)	Syrian Islamic Front; Veto Power; Purpose (Opposition); Al-Nusra Front; Cohesion; Commitment; Oppression; Violence; Negotiated Settlement	Knowledge
		Veto Power (within Opposition)	External Support; Purpose (Opposition); Rebel Spoilers	Knowledge
		Negotiated Settlement	UN; Rebel Spoilers; Assad Regime; Violence	Knowledge
10	Casual Stories: IV-DV Relationships (Presented as a Quad Chart)	DV Shorter Wars (Upper Left-Hand Quadrant)	Unified Opposition; Less Veto Players; US Military Action; Foreign Assistance (Could have +/- effect); Safety of Survival; Conventional Civil War	Knowledge
		DV: Longer Wars (Upper Right-Hand Quadrant)	Fragmented Opposition; More Veto Players; Limited Foreign Intervention (HA & Military); Threats to Survival (of opposition factions); Unconventional War; Rebel Governance; State-Offered Concessions; Insistence on Regime Change	Knowledge
		DV: (+) Negotiated Settlement (Lower Left-Hand Quadrant)	Unified Opposition; More Veto Players; Third Party Arbiter; Sequencing Negotiations; Desire for Policy Change	Knowledge
		DV: (-) Negotiated Settlement (Lower Right-Hand Quadrant)	Fragmented Opposition; Less Veto Players; US Military Action; Foreign Intervention; Rhetorical Insistence for Regime Change; Desire for Political Power	Knowledge
11	Casual Stories: Fragmented Opposition (Longer War)	Political fragmentation is a result of internal and external actors. Social fragmentation is a result of cleavages; (1) Political unity varies, social structure remains constant; (2) External support undermines and changes opposition actors	This group labels this a structural causal logic (as defined by Craig Parsons); This group cites this (Pearlman 40)	Understanding
		Structure of prewar political networks influences structure of armed groups; (1) Integrated, Vanguard, Parochial, Fragmented	This group labels this an institutional casual logic; Cite this (Staniland 36)	Understanding
		Threats to survival generate cooperation among armed actors; (1) Safety: Without it, groups fight the regime. With it, groups fight each other; (2) US aid had unintended impact (fragmented the opposition)	This group labels this a psychological casual logic and labels (2) as an institutional casual logic. They cite this (Wohl 42)	Understanding
		Two things determine effectiveness of rebel governance systems: (1) Support of the civilian populace ("must identify with the rebel cause"); (2) Territorial control	This group cites this as (Mampilly 44); They label (1) as an ideational causal logic and (2) as a structural causal logic	Understanding

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
12	Casual Stories: Foreign Intervention (Longer War)	Foreign Fighters are going to Syria because they can: (1) Easy to get there; (2) No punishment for going (implicit support of the opposition); (3) Rebels control borders	This group labels this as a structural casual logic. They cite this as (Hegghammer 47)	Understanding
		Insistence on regime change shuts down negotiations, prolongs the war, and increases chance for US military involvement: (1) Assad has no incentive to negotiate	This group labels this an institutional casual logic; Cite this (Downes 61))	Understanding
13	Casual Stories: Negotiated Settlement (Longer War)	Negotiations with fragmented oppositions typically fail to end the conflict: (1) Lack credibility to "deliver" their part of the bargain; (2) No authority to speak for other factions; (3) States offer concessions to reveal info and strengthen moderates	This group labels this a structural causal logic. This group cites this (Cunningham 34)	Understanding
		Through imposing an (less than optimal) agreement on unwilling combatants or excluding a certain actor from negotiations, veto players may block settlement terms resulting in failed negotiations	This group labels this a structural casual logic. This group cites this (Cunningham 34)	Understanding
		Insistence on regime change shuts down negotiations, prolongs the war, and increases chance for US military involvement: (1) Assad has no incentive to negotiate	This group labels this an institutional casual logic; Cite this (Downes 61))	Understanding
14	Casual Stories: Additional Variables that Describe the Landscape	Effectiveness of Rebel Governance: (1) Support of the civilian populace ("must identify with the rebel cause"); (2) Territorial control	Same as above	
		Presence of Foreign Fighters: (1) Easy to get there; (2) no punishment for going (implicit support of the opposition); (3) rebels control borders	Same as above	
		Structure of Armed Groups: (1) Structure of prewar political networks determines structure of armed group; (2) Integrated, Vanguard, Parochial, Fragmented	Same as above	
		Ability for Authoritarian Regimes to Adapt: (1) Consolidate power and improve mechanisms of security and control; (2) Institutional organization on sectarian lines effects outcome	This group labels this an institutional casual logic.	Understanding
		Nation-Building and Path Dependence: (1) Repression of "out-groups," instead of nationalism is Assad's foundation for legitimacy; (2) By not creating an institution that assimilates all Syrian people, it sets in motion the course of events leading to conflict (path-dependence)	This group labels this an institutional casual logic.	Understanding
15	[Hidden Slide] Casual Stories: Structural Logic: Opposition Fragmentation and Governance	Negotiations with fragmented oppositions typically fail to end the conflict: (1) Lack credibility to "deliver" their part of the bargain; (2) No authority to speak for other factions; (3) States offer concessions to reveal info and strengthen moderates	Same as above	
		Political fragmentation is a result of internal and external actors. Social fragmentation is a result of cleavages; (1) Political unity varies, social structure remains constant; (2) External support undermines and changes opposition actors	Same as above	
		Two things determine effectiveness of rebel governance systems: (1) Support of the civilian populace ("must identify with the rebel cause"); (2) Territorial control	Same as above	
		Foreign Fighters are going to Syria because they can: (1) Easy to get there; (2) No punishment for going (implicit support of the opposition); (3) Rebels control borders	Same as above	
16	[Hidden Slide] Casual Stories: Structural Logic: Defining the Conflict:	What Civil Wars Can Tell Us About the Syrian Conflict: (1) Group fragmentation prolongs conflict by increasing the number of warring actors; (2) Multiple warring actors increase the complexity of a negotiated agreement; (3) Multiple actors are utilized as proxies by outside agencies resulting in a prolonged conflict; (4) Strong outside actor required to enforce agreements of disparate groups	This group cites this as (Christia 8)	Understanding
		Technology of Rebellion in the Syrian Civil War: (1) The Syrian Civil War is being waged in a conventional manner with pitched battles, visible front lines, and contiguous areas held by the regime or rebels; (2) Conventional Civil Wars are shorter and more intense; (3) Foreign assistance could potentially tip the advantage of one side over the other	This group cites this as (Balcells and Kalyvas 11)	Understanding

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
16	[Hidden Slide] Casual Stories: Structural Logic: Defining the Conflict:	Syria's Civil War: (1) Multiple warring actors increase the complexity of a negotiated agreement; (2) Multiple warring actors continue to fight due to fear of the government renegeing on concessions; (3) Strong outside actor required to enforce agreements of disparate groups	This group cites this as (Fearon 13)	Understanding
17	[Hidden Slide] Casual Stories: Structural Logic: Barriers to War Resolutions:	Through imposing an agreement, sequencing negotiations to address each dimension, and ensuring a multiparty-inclusive approach, international peace-building efforts will result in negotiated settlements	This group cites this as (David Cunningham; Fotini Christia; James Fearon)	Understanding
		Through imposing an (less than optimal) agreement on unwilling combatants or excluding a certain actor from negotiations, veto players may block settlement terms resulting in failed negotiations	Same as above	
18	[Hidden Slide] Casual Stories: Institutional Logic: The Opposition and The Regime	The Opposition: Structure of prewar political networks influence structure of armed groups: (1) Integrated, Vanguard, Parochial, Fragmented	Same as above	
		The Regime: Conflict has given the Assad regime motivation to consolidate power, improve mechanisms of security and control, and affect the outcome of the conflict: (1) Reconfigured armed forces, paramilitary, intelligence, security; (2) Institutional organization on sectarian lines	This group cites this as (Heydemann 54)	Understanding
		The Regime: Repression of "out-groups," instead of state-level nationalism, was the foundation for Assad's legitimacy. Nation-building creates path-dependence: (1) By not creating an institution that assimilates all Syrian people, it set in motion the course of events leading to conflict (path-dependence)	Same as above	
		The Regime: Insistence on regime change shuts down negotiations, prolongs the war, and increases chance for US military involvement: (1) Assad has no incentive to negotiate	Same as above	
19	[Hidden Slide] Casual Stories: Institutional Logic: Barriers to War Resolutions:	The conflict in Syria is very resistant to resolution in part because of the barriers to settlement presented by many internal and external veto players	This group cites this as (David Cunningham; Barbara Walter)	Understanding
20	[Hidden Slide] Casual Stories: Ideational Logic:	The Opposition: Two things determine effectiveness of rebel governance systems: (1) Support of the civilian populace ("must identify with the rebel cause"); (2) Territorial control	Same as above	
21	[Hidden Slide] Casual Stories: Psychological Logic: The Opposition and Barriers to War Resolution	The Opposition: Threats to survival generate cooperation among armed actors; (1) Safety: Without it, groups fight the regime. With it, groups fight each other; (2) US aid had unintended impact (fragmented the opposition)	Same as above	
		Barriers to War Resolutions: Opposition forces will continue to fight for political power versus policy change and will not commit to negotiated settlements due to fear of regime renege.	This group cites this as (James Fearon; Kathleen Cunningham)	Understanding
22	[Hidden Slide] Casual Stories: Multiple Casual Logics	Roles and Mechanisms of Insurgency and the Conflict in Syria: (1) Six Mechanisms - Rational calculation, focal points, social norms, emotions, status considerations, and psychological mechanisms; (2) These mechanisms "move" individuals throughout the spectrum of participation in insurgency and counter-insurgency	This group cites this as (Petersen 18)	Understanding

Slide	Slide Theme	System Elements/Dynamics	Connections	Component Achieved
23		Regime is on one side of the Civil War with Regime Victory portrayed outside of the Civil War oval	The Assad regime conducts indiscriminate attacks to undermine the opposition's stability efforts. Yet this pushes the conflict toward opposition victory	Understanding
		Opposition is on the other side of the Civil War with Opposition Victory portrayed outside of the Civil War oval	Opposition forces attempt to provide services and stability to undermine the Assad regime which creates a negative feedback loop as the opposition will increase attacks on the regime to maintain their reputation	Understanding
		The fight between the regime and the opposition has conventional fighting taking place.	This also favors opposition victory.	Understanding
24	[Graphic Depiction] Systems Integration: Syrian Civil War	The Opposition is made up of numerous different entities exhibiting a "parochial structure" could lead to fragmentation. However, the opposition could unite as well.	If the Opposition unites, then the civil war could shift toward Opposition Victory. However, if they fragment, then that could lead to regime victory	Understanding
		There are "Energetic Reminders" who do not want to stop fighting	These entities tend to perpetuate the conflict	Understanding
25		There are numerous external supporting groups which generates negative feedback since each group has their own agenda. For example, Iraq, Russia, Iran, and Hezbollah all support the Regime whereas the U.S., Qatar, Saudi Arabia, and Turkey support Opposition forces.	Because the regime has a more efficient use of funding and resources than the Opposition (which is fragmented where each external entity supports different fragments of the Opposition), the civil war could shift toward Regime Victory	Understanding
26		A negotiation between the regime and the opposition is difficult because of commitment problems	There are "Veto Players" on both sides of the civil war who must be satisfied for a settlement to be accepted	Understanding
27	[Graphic Depiction] Experimental Action Throughout Time: 1970-2014	Timeline of US-Syrian Relations throughout time	1970s - Black; 1980s - Amber/Red; 1990s - Amber; 2000 - Green; 2005 - Amber; 2006-2010 - Red; 2011-2012 - Amber; 2012-2014 (early part) - Black; Present - Amber	Understanding
28		Current Potentialities: (1) U.S. can provide support to good Rebels to destroy the regime; (2) The U.S. can attack the regime while supporting the good Rebels to neutralize the regime; and (3) the U.S. can support a negotiated settlement between the international community, the rebels and the regime.	The outcomes are: (1) Regime change (though Syria would have both good and bad rebels left over); (2) Either the good rebels would have to deal with the bad rebels or the U.S. would have to deal directly with Russia and Iran as well as the bad rebels; (3) status quo where the regime has a new polity (to include the PKO/MFO) and would have to deal with the bad rebels who would seek to disrupt the regime and new polity	Understanding
29	[Graphic Depiction] Experimental Action Throughout Time: 1970-2014	Positive Engagement: Intervention would cultivate and sustain atypical partnership; Policy objective would be to create regional stability; The time frame was in the 1990s; This assumes that positive influence is best achieved through active diplomacy and partnership	The outcome would be one where the U.S., EU, Israel, and Saudi Arabia work with Russia, Iran, and Syria to strengthen Syria's place in the U.S. sphere of influence and create a broader community of interest. This group cites Connolly	Understanding
30		Fostering a Capable Constituency: Interventions would strengthen civil society capacity to actively participate in the republic; Technical assistance and development aid programs would increase support and awareness of public roles in government and seek to build communities of interest in society; The Policy Objective would be regime stability to set the conditions for role experimentation; The Time frame was from 2001 onward to bolster Syria's resilience to GWOT;	Aid programs are used to bring the U.S./NGOs, Syrian society, and the regime closer together. The casual claims impacted are fractionalization and commitment	Understanding
31		Supporting Nonviolent Change: Interventions are to persuade/coerce preemptive changes in regime policies to forestall uprisings; Narrative illuminates the diffusion of Arab Spring ideology and the risk of responding poorly to protest; 3rd party observers monitor implementation and integration; Policy Objective would be regime stability; the time frame was from 2011 at the onset of the Arab Spring.	With the U.S. on one side and Iran on the other, Russia, the Syrian society, Assad regime and UN/IGOs would work together better	Understanding
32		Militant Contingencies: Interventions are the immediate use of force to determine a quick and reasonably certain outcome; Unconventional warfare via unified action, with surrogate partner force of choice; transition partner forces to conventional war as quickly as possible; surgical strike options related to R2P; Policy objective is a regime change; The time frame was from 2000s - preparation of the environment (PE) UW assessment 2011- Arab Spring triggers preparation of surrogate "partner force of choice" 2011-2012 - DP for surgical strikes and resistance mobilization;	The U.S. led contingent of NATO, Jordanian, PFOC, Saudi Arabian, and Turkish forces defeat the regime (backed by ISR and Iraq) against Iran, Russia, and Radical freedom fighters. The casual claims impacted are fractionalization, authoritarian consolidation and disruptive 3rd party efforts resulting from prolonged conflict. The repercussions from this action are difficult to know.	Understanding

Source: Created by author.

Discussion of Assessment

Table 9, figure 9, and figure 10 list and depict the findings described in the previous section. Table 9 contains the number of coded system elements or connections for a specific level of the Army’s cognitive hierarchy model achieved (i.e., data, information, knowledge, or understanding). For example, Group 1 had 12 system elements or connections coded as data, 38 coded as information, 29 coded as knowledge, and five coded as understanding. The word count is included in this table as one more metric to use when comparing the groups. The groups that are most comparable in this study are 1, 2, and 5. These groups created the presentations after the Advanced Operations Course, between the 33rd and 36th week of CGSOC. The presentations are approximately the same length and the word counts are very similar. Yet, the difference between these groups is the amount of material in the presentations coded as either data/information or knowledge/understanding. To better see this difference, it is useful to use a chart (see figure 9).

Table 9. Assessment of Groups’ PowerPoint Presentations

Level Achieved	Group 1 (Spring Elective)	Group 2 (Fall Elective)	Group 3 (Satellite)	Group 4 (Common Core)	Group 5 (LDW)
Data	12	5	0	27	0
Information	38	38	19	37	17
Knowledge	29	8	20	21	46
Understanding	5	6	6	1	32
Total	84	57	45	86	95
Word Count	1540	1225	851	1018	1636

Source: Created by author.

Figure 9 depicts the assessment of all five groups included in this study. The analysis of presentation material is represented as a percentage where the number of coded system elements or connections for a specific level of the hierarchy model achieved is divided by the total number of system elements or connections made by the group. For example, using table 9, Group 2 (Fall Elective) has eight system elements or connections coded as knowledge. This group has a total of 57 system elements or connections coded as knowledge. Therefore, 14.04 percent of the presentation material is assessed as knowledge.

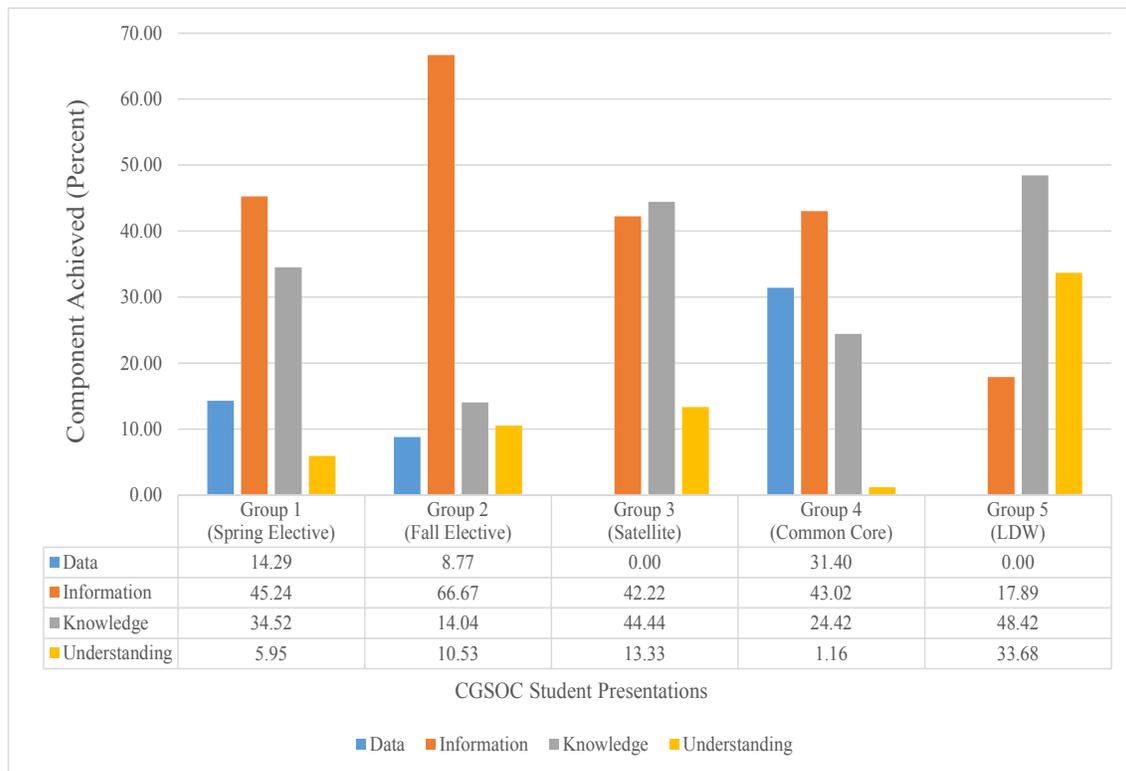


Figure 9. Assessment of CGSOC Student Groups' Presentations

Source: Created by author.

ADRP 6-0 emphasizes the importance of developing an understanding of an operational environment by saying that because a commander's decisions ultimately direct the actions of the force, "commanders need knowledge and understanding to make effective decisions . . . With understanding, commanders can make effective decisions and relegate the actions of the force. By developing understanding, commanders and staffs prepare effective plans and assess operations accurately."¹⁶⁹ Therefore, figure 10 is also a depiction of the assessment of all five groups included in this study. However, this chart depicts data and information combined as a percentage as well as knowledge and understanding combined as a percentage. For example, using table 9, Group 5 (LDW) has 46 system elements or connections coded as knowledge and 32 coded as understanding for a total of 78. This group has a total of 95 system elements or connections. Therefore, 82.11 percent of the presentation material is assessed as knowledge and understanding.

¹⁶⁹Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

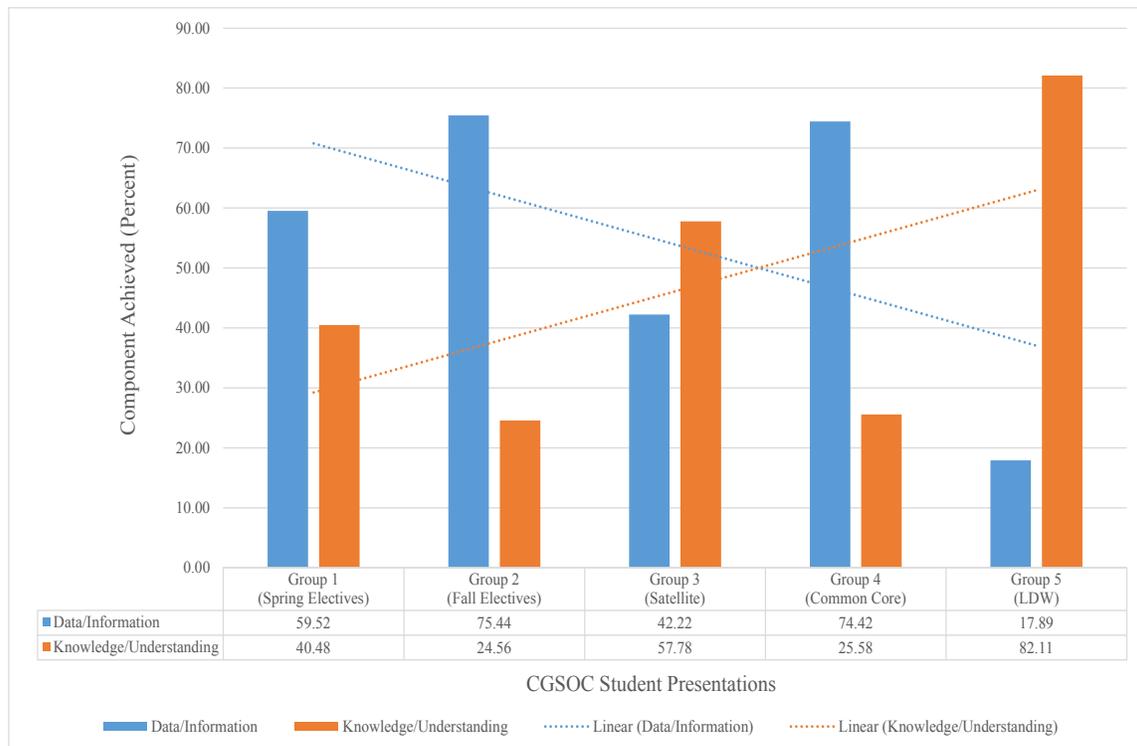


Figure 10. Combined Data/Information and Knowledge/Understanding

Source: Created by author.

Using both figure 9 and figure 10, one result is apparent: the percentage of knowledge and understanding achieved by Group 5 (LDW) is significantly higher than the other groups. There could be several explanations for this. First, it is possible that a group with more students will achieve a higher percentage of knowledge and understanding. For example, Group 5 (LDW) had seven students while Group 1 (Spring Elective) had five and Group 2 (Fall Elective) had four. However, this explanation does not explain why Group 5 (LDW) achieved a higher level of knowledge and understanding than Groups 3 or 4, which had 16 students each.

Another explanation might be that the more overall time a group has to complete the assignment, the higher the percentage of knowledge and understanding. However, Groups 1 and 2 both had eight days to complete the assignment while Group 5 (LDW) had four days. A third explanation is that the higher the amount of class time to prepare a presentation the higher the percentage of knowledge and understanding that group will achieve. This one seems plausible since Group 5 (LDW) had 16 hours of class time, while the other groups had significantly less. Yet, this does not explain why Group 1 (Spring Elective) achieved a higher percentage of material coded as knowledge and understanding than Group 2 (Fall Elective). Both groups had the exact same amount of class time to work on the presentations.

A fourth explanation is that the amount of time a group spends in CGSOC the higher the percentage of knowledge and understanding that group will achieve. This is logical since Group 5 (LDW) achieved a higher percentage of knowledge and understanding than Groups 3 and 4. However, that does not explain why Group 4 (Common Core) achieved as high a percentage of knowledge and understanding as Group 2 (Fall Elective). Nor does it explain why Group 3 (Satellite) achieved a higher percentage of knowledge and understanding than Groups 1 and 2.

One final explanation for the difference in the percentage of knowledge and understanding achieved by Group 5 (LDW) and the other four groups, is that the methodology used to develop an understanding of an operational environment greatly influences the percentage of knowledge and understanding; an explanation supported by joint and Army doctrine which advocate using a systems perspective and incorporating

expert opinion.¹⁷⁰ Group 5 (LDW) used a systems perspective informed by abductive reasoning. As a result, this group achieved a high level of knowledge and understanding. The next highest groups are Group 3 (Satellite), which used the PMESII framework and achieved 57.78 percent and Group 4 (Common Core), which used the PMESII-PT framework and a systems perspective and achieved 25.58 percent.

These explanations are, of course, simplistic since only one condition is considered at a time. To obtain an accurate and reliable conclusion, several conditions need to be considered simultaneously. For example, though Group 4 (Common Core) had 16 students and used both the PMESII-PT framework and a systems perspective, they did not achieve a high percentage of knowledge and understanding. One possible reason for this is because this group created the presentation within the first week of CGSOC. Additionally, this group learned about the PMESII-PT framework the day before they created the presentation. More importantly, this group learned about a systems perspective only hours before they created the presentation.

The only groups in this study with similar conditions are Groups 1, 2, and 5. These groups had: similar numbers of students, though Group 5 (LDW) had slightly more; similar amounts of overall time to work on the assignment, though Groups 1 and 2 had twice as much; similar word counts, though Group 5 (LDW) is slightly higher; and similar amounts of time in CGSOC. Group 5 (LDW) did have more class time to finish the presentation than Groups 1 and 2, but when weighed with the overall amount of time

¹⁷⁰Joint Chiefs of Staff, Joint Publication 2-01.3, I-2; Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

to finish the presentation, this condition seems less significant. However, the results for these three groups are significantly different.

Group 5 (LDW) has 82.11 percent of the presentation material that achieves knowledge and understanding. Group 1 (Spring Elective) has 40.48 percent and Group 2 (Fall Elective) has 24.56 percent. Though the conditions were not exactly the same between these groups, a reasonable inference about why Group 5 (LDW) achieved a significantly higher percentage of knowledge and understanding is that Group 5 (LDW) used abductive reasoning to inform a systems perspective while Groups 1 and 2 did not explicitly use either of these methodologies to develop an understanding of the operational environment.

Conclusion

In this study, five CGSOC student groups' PowerPoint presentations of the Syrian conflict are assessed using the Army's cognitive hierarchy model. The conditions and results are presented, discussed, and compared. There were several conditions accounted for: the number of students; the amount of overall time to finish the presentation; the amount of class time to finish the presentation; the word count; amount of time in CGSOC; and the methodology used to develop an understanding of an operational environment. The conditions are most similar between Groups 1, 2, and 5. However, the methodological approach used by Groups 1 and 2 are very different from Group 5 (LDW). Groups 1 and 2 do not explicitly use a specific framework or approach to analyze the Syrian conflict, while Group 5 (LDW) uses abductive reasoning as a way to create knowledge and achieve understanding. The findings of this study, while not conclusive,

suggest that Group 5 (LDW) achieved a higher percentage of knowledge and understanding than the other groups due to the employment of abductive reasoning.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

As our Army transitions from a decade of war, it is critical for us to focus on the future. Successfully preventing conflict, shaping the environment, and winning our Nation's wars requires substantial preparation across our Army. We must strive to understand the complex future and prepare our Army to operate and adapt in any environment.

— Robert W. Cone, *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*

The future operational environment is described as volatile, uncertain, complex, and ambiguous and composed of numerous complex adaptive systems.¹⁷¹ To fulfill the Army's roles of preventing conflict, shaping the international environment, and winning the nation's wars in this environment, military professionals must cultivate the ability to develop an understanding of the human domain and complex adaptive systems.¹⁷² According to the Army's cognitive hierarchy model, achieving understanding is an iterative method in which data are processed to produce information. When information is analyzed it is refined into knowledge.¹⁷³ Scholars add that expert opinion is required to refine information into knowledge.¹⁷⁴ This is consistent with Army doctrine which states that "knowledge is the result of individual cognition," which is acquired through "study,

¹⁷¹Magee, *Strategic Leadership Primer*, 1; Joint Chiefs of Staff, *Planner's Handbook for Operational Design*, II-4.

¹⁷²Shalikashvili, cover letter.

¹⁷³Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

¹⁷⁴European Committee for Standardization, *European Guide to Good Practice*, 6.

experience, practice, and human interaction.”¹⁷⁵ Next, military professionals “apply judgment to transform knowledge into situational understanding.”¹⁷⁶ Judgment is developed from “experience, training, study, and creative and critical thinking.”¹⁷⁷

Yet, neither joint nor Army doctrine explains what type of studies should be used to achieve understanding. The type of studies advocated in this thesis that should be used by military professionals are those with mature theories. Joint and Army doctrine state that to develop an understanding of an operational environment, military professionals are to use operational and mission variables as well as civil considerations. However, when military professionals collect information about the components of these frameworks, they typically rely on intuition to inform the decision-making process.¹⁷⁸ This introduces biases and flawed heuristics that lead to inaccurate conclusions and ultimately ineffective or counterproductive military intervention.¹⁷⁹ Instead of using intuition, abductive reasoning is proffered as a means to achieve understanding. Ian Shapiro defines abductive reasoning as “reasoning on the basis of *mature theories* from observed effects to unobservable causes. Abduction to unobservables is a way of generating knowledge in which *theory plays a vital role,*” (emphasis added).¹⁸⁰

¹⁷⁵Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, 2-7.

¹⁷⁶Ibid.

¹⁷⁷Ibid., 2-9.

¹⁷⁸Williams, “Heuristics and Biases.”

¹⁷⁹Ibid.

¹⁸⁰Shapiro, *The Flight from Reality*, 39.

To test the utility of abductive reasoning, five CGSOC student groups' PowerPoint presentations on the Syrian conflict are assessed and compared. The material in each group's presentation is assessed as achieving one of the four levels of the Army's cognitive hierarchy model (i.e., data, information, knowledge, or understanding). Of the five groups, only three had similar conditions (i.e., number of students, amount of overall time, amount of class time, word count, and amount of time in CGSOC). Yet, the condition which was different between these three groups was the methodological approach used to achieve understanding. Results of this assessment suggest, though not conclusively, that a group which uses abductive reasoning to inform a systems perspective will achieve a higher percentage of knowledge and understanding than a group which does not explicitly do so.

Recommendations

The purpose of this thesis is to answer the question of how Army mid-career PME can more fully prepare military professionals to develop an understanding of an operational environment. The following recommendations are offered in response to this question. First, another study should be conducted which uses groups that share similar conditions, except for the use of abductive reasoning. As highlighted in the previous section, there were conditions which were not similar between some of the groups used in this study. For example, Groups 3 (Satellite) and Group 4 (Common Core) had more people than the other groups, had less overall time and less class time than the other groups, and had less time in CGSOC than the other groups. Yet, they used methodologies recommended in joint and Army doctrine (e.g., PMESII-PT, a systems perspective).

For example, Group 3 (Satellite) used the PMESII-PT framework and achieved a higher percentage of knowledge and understanding than Group 1 (Spring Elective), which did not explicitly use any of the recommended methodologies. However, Group 3 (Satellite) did not achieve as high of a percentage of knowledge and understanding as Group 5 (LDW). However, no definitive conclusion can be made comparing Groups 3 and 5 since the conditions were not the same (i.e., number of students, overall time, class time, and time in CGSOC). Therefore, to determine whether the employment of abductive reasoning improves a group's percentage of knowledge and understanding, all conditions, except for the methodology used to achieve understanding, would need to be the same.

Second, mid-career PME educators should consider teaching abductive reasoning as a way to inform a systems perspective. Currently, Army mid-career PME teaches the Army Design Methodology, PMESII, PMESII-PT, and a systems perspective, but does not officially teach abductive reasoning as a way to inform these methodologies. However, some scholars consider abductive reasoning to be the only knowledge-generating method of inference and “the only logical operation which introduces any new idea.”¹⁸¹ When faced with an environment that is complex, military professionals are responsible for developing an understanding of the causes of these complexities and then intervene to successfully deal with these causes and improve the state of affairs. To do this, military professionals need abductive reasoning since this approach incorporates existing knowledge to create new ideas about how to deal with the current complexity.

¹⁸¹Peirce, *Collected Papers of Charles Sanders Peirce*, vols. 7 and 8, 106.

Third, in conjunction with the second recommendation, PME should consider introducing students to mature theories developed by the social sciences, with particular emphasis on those developed in political science. As discussed in chapter 3, to achieve understanding, it is necessary to consult and learn mature theories that deal with human behavior in situations that are similar to the ones military professionals face in combat. While theories will not provide the answers for a specific context, they will provide a start point from which to develop plans. Without a solid foundation about answers to the questions of who, what, when, where, how, and why of human actions in war, military professionals will most likely deal only with symptoms of causes, and not the actual causes of violence and conflict.

Fourth, mid-career PME should consider requiring CGSOC students to achieve understanding when creating presentations about an operational environment. As described in chapter 3, students are not required to use the Army's cognitive hierarchy model when developing presentations. Instead of using Bloom's taxonomy, mid-career PME and military trainers should use, as a start point, the Army's cognitive hierarchy model to assess classroom and real-world planning efforts. It is possible that mid-career military professionals are unaware of the method used to develop an understanding of an operational environment. Knowing the value of this model, military professionals could strive to achieve understanding when analyzing an operational environment and when presenting their findings. Using this classification scheme, PME institutions and military trainers could provide valuable feedback which could help guide how military professionals approach the complexity of an operational environment.

BIBLIOGRAPHY

Books

- Autesserre, Severine. *The Trouble with the Congo: Local Violence and the Failure of International Peacebuilding*. Cambridge, MA: Cambridge University Press, 2010.
- Biddle, Stephen. *Military Power: Explaining Victory and Defeat in Modern Battle*. Princeton, NJ: Princeton University Press, 2004.
- Christia, Fotini. *Alliance Formation in Civil Wars*. Cambridge, MA: Cambridge University Press, 2012.
- Dempsey, Martin E. "Introductory Remarks." In *War Termination: The Proceedings of the War Termination Conference United States Military Academy West Point*, edited by Matthew Moten, 4. Fort Leavenworth, KS: Combat Studies Institute Press, 2010.
- Hall, C. S., and G. Lindzey. *Theories of Personality*. New York: Wiley, 1957.
- Houser, Nathan, and Christian Kloesel, eds. *The Essential Peirce: Selected Philosophical Writings*. Vol. 1. Bloomington, IN: Indiana University Press, 1992.
- Kalyvas, Stathis. *The Logic of Violence in Civil War*. Cambridge, MA: Cambridge University Press, 2006.
- Kalyvas, Stathis, Ian Shapiro, and Tarek Masoud. *Order, Conflict, and Violence*. Cambridge, MA: Cambridge University Press, 2008.
- Magee, Roderick R. II, ed. *Strategic Leadership Primer*. Carlisle Barracks, PA: U.S. Army War College, 1998.
- Parsons, Craig. *How to Map Arguments in Political Science*. Oxford, UK: Oxford University Press, 2007.
- Pearlson, Keri E., and Carol S. Saunders. *Managing and Using Information Systems: A Strategic Approach*, 4th ed. Hoboken, NJ: John Wiley and Sons, 2010.
- Pierce, Charles S. *Collected Papers of Charles Sanders Peirce*. Vols. 1, 2, 3, 4, 5, and 6. Edited by Charles Hartshorne and Paul Weiss. Cambridge, MA: Harvard University Press, 1960.
- . *Collected Papers of Charles Sanders Peirce*. Vols. 7 and 8. Edited by Arthur W. Burks. Cambridge, MA: Belknap Press, 1958.

- Shapiro, Ian. *Flight from Reality in the Human Sciences*. Princeton, NJ: Princeton University Press, 2005.
- Smith, Rupert. *The Utility of Force: The Art of War in the Modern World*. New York, NY: Alfred A Knopf, 2007.
- Stiehm, Judith. *The U.S. Army War College: Military Education in a Democracy*. Philadelphia: Temple University Press, 2002.
- Sutherland, John W. *Systems: Analysis, Administration, and Architecture*. Madison, WI: Van Nostrand Reinhold Company, 1975.
- Weissman, Jerry. *Presentation Skills That Will Take You to the Top (Collection)*. Saddle River, NJ: Pearson Education, Inc., 2013.
- Yarger, Harry R. *Strategy and the National Security Professional: Strategic Thinking and Strategy Formulation in the 21st Century*. Westport, CT: Praeger Security International, 2008.
- _____. *Strategic Theory for the 21st Century: The Little Book on Big Strategy*. Carlisle Barracks, PA: Strategic Studies Institute, U.S. Army War College, February 2006.
- Yates, JoAnne, and Wanda Orlikowski. "The PowerPoint Presentation and Its Corollaries: How Genres Shape Communicative Action in Organizations." In *Communicative Practices in Workplaces and the Professions: Cultural Perspectives on the Regulation of Discourse and Organizations*, edited by Mark Zachry and Charlotte Thralls, 67-92. Amityville, NY: Baywood Publishing Company, Inc., 2007.

Government Documents

- Headquarters, Department of the Army. Army Doctrine Publication 1, *The Army Profession*. Washington, DC: Government Printing Office, September 2012.
- _____. Army Doctrine Publication 3-0, *Unified Land Operations*. Washington, DC: Government Printing Office, October 2011.
- _____. Army Doctrine Reference Publication 3-0, *Unified Land Operations*. Washington, DC: Government Printing Office, May 2012.
- _____. Army Doctrine Reference Publication 3-07, *Stability Operations*. Washington, DC: Government Printing Office, August 2012), 4-8.
- _____. Army Doctrine Reference Publication 5-0, *The Operations Process*. Washington, DC: Government Printing Office, May 2012.

_____. Army Doctrine Reference Publication 6-0, *Mission Command*. Washington, DC: Government Printing Office, May 2012.

_____. Field Manual 2-01.3/MCRP 2-3 A, *Intelligence Preparation of the Battlefield/Battlespace*. Washington, DC: Government Printing Office, October 2009.

_____. Field Manual 2-01.3, Change 2, *Intelligence Preparation of the Battlefield/Battlespace*. Washington, DC: Government Printing Office, December 2010.

_____. Field Manual 3-0, Change 1, *Operations*. Washington, DC: Government Printing Office, February 2011.

_____. Field Manual 5-0, *The Operations Process*. Washington, DC: Government Printing Office, March 2010.

_____. Field Manual 6-0, *Mission Command: Command and Control of Army Forces*. Washington, DC: Government Printing Office, August 2003.

Joint Chiefs of Staff. Joint Publication 2-01.3, *Joint Intelligence Preparation of the Operational Environment*. Washington, DC: Government Printing Office, June 2009.

_____. Joint Publication 3-0, *Joint Operations*. Washington, DC: Government Printing Office, August 2011.

_____. *Planner's Handbook for Operational Design, Version 1.0*. Suffolk, VA: Joint Staff, J-7, Joint and Coalition Warfighting, October 2011.

_____. Shalikashvili, John M. *National Military Strategy of the United States of America: Redefining America's Military Leadership*. Washington, DC: Joint Staff, 1997.

U.S. Army Training and Doctrine Command G2. *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, August 2012.

Van Riper, Paul K. "An Introduction to System Theory and Decision-Making." 2010. Quoted in Joint Chiefs of Staff. *Planner's Handbook for Operational Design, Version 1.0*. Suffolk, VA: Joint Staff, J-7, Joint and Coalition Warfighting, 7 October 2011.

Journals/Periodicals

Ackoff, Russell L. "From Data to Wisdom." *Journal of Applied Systems Analysis* 16 (1989): 3-9.

- Bacharach, Samuel B. "Organizational Theories: Some Criteria for Evaluation." *Academy of Management Review* 14, no. 4 (1989): 498.
- Brown, Robert B. "Movement and Maneuver: A Vision for the Future," *Army* 61, no. 6 (June 2011): 61.
- Brownlee, Les, and Peter J. Schoomaker. "Serving a Nation at War: A Campaign Quality Army with Joint and Expeditionary Capabilities." *Parameters* 34, no. 2 (Summer 2004): 18.
- Chiarelli, Peter W., and Patrick R. Michaelis. "Winning the Peace: The Requirements for Full-Spectrum Operations." *Military Review* 85, no. 4 (July-August 2005): 4-17.
- Cleveland, Charles T., and Stuart L. Farris. "Toward Strategic Landpower." *Army* 63, no. 7 (July 2013): 21.
- Davis, Gordon B. Jr., and James B. Martin, "Developing Leaders to Aapt and Dominate for the Army of Today and Tomorrow." *Military Review* 92, no. 5 (September-October 2012): 63-74.
- Fischer, Hans Rudi. "Abductive Reasoning as a Way of Worldmaking." *Foundations of Science* 6, no. 4 (2001): 361-383.
- Friedrichs, Jörg, and Friedrich Kratochwil. "On Acting and Knowing: How Pragmatism Can Advance International Relations Research and Methodology," *International Organization* 63, no. 4 (2009): 710.
- Kalyvas, Stathis, and Matthew Adam Kocher. "Ethnic Cleavages and Irregular War: Iraq and Vietnam." *Politics and Society* 35, no. 2 (June 2007): 183-223.
- Pfanner, Toni. "Interview with General Sir Rupert Smith." *International Review of the Red Cross* 88, no. 864 (2006): 719-727.
- Pickering, Thomas R. "A Diplomat's Perfect Storm: How to Move Forward in Syria." *Prism* 4, Syria Supplement (2014): 6-13.
- Rowley, Jennifer. "The Wisdom Hierarchy: Representations of the DIKW Hierarchy." *Journal of Information Science* 33, no. 2 (2007): 163-180.
- Sullivan, Patricia L. "War Aims and War Outcomes: Why Powerful States Lose Limited Wars." *Journal of Conflict Resolution* 57, no. 3 (2007): 496-524.
- Williams, Blair S. "Heuristics and Biases in Military Decision Making." *Military Review* 90, no. 5 (September-October 2010): 40-52.

Online Sources

- Ackerman, Spencer. "Microsoft Helps Army Avoid 'Death by PowerPoint.'" *Wired*, 17 June 2011. <http://www.wired.com/2011/06/microsoft-helps-the-army-avoid-death-by-powerpoint/> (accessed 28 July 2014).
- Am Yisrael Chai! "Brotherhood of Terror–The Muslim Brotherhood Part 1 of 4." You Tube. http://www.youtube.com/watch?v=QdFG_VXBeeM (accessed 10 June 2014).
- Bellinger, Gene, Durval Castro, and Anthony Mills. "Data, Information, Knowledge, and Wisdom." *Systems Thinking*, 2004. www.systems-thinking.org/dikw/dikw.htm (accessed 10 June 2014).
- Bumiller, Elisabeth. "We Have Met the Enemy and He Is PowerPoint." *The New York Times*, 26 April 2010. http://www.nytimes.com/2010/04/27/world/27powerpoint.html?_r=0 (accessed 29 July 2014).
- Central Intelligence Agency. "The World Factbook." Modified 6 June 2014. <https://www.cia.gov/library/publications/the-world-factbook/> (accessed 29 July 2014).
- Cone, Robert W. Quoted in U.S. Army Training and Doctrine Command G2. *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*, 2. Fort Leavenworth, KS: U.S. Army Training and Doctrine Command, August 2012. http://www.arcic.army.mil/app_Documents/TRADOC_Paper_Operational-Environments-to-2028-Strategic-Environment-for-Unified-Land-Operations_AUG2012.pdf (accessed 22 July 2014).
- Dehghanpisheh, Babak. "Scions of the Surge." *Newsweek*, 15 March 2008. <http://www.newsweek.com/how-iraq-war-changes-us-officers-83711> (accessed 22 July 2014).
- Dempsey, Martin E. *Capstone Concept for Joint Operations: Joint Force 2020*, 10 September 2012. Defense Technical Information Center. <http://www.dtic.mil/doctrine/concepts/concepts.htm> (accessed 3 June 2014).
- Doctrine Man. "We have met the enemy and he is us: A possible 4-step recovery program for PME," Thomas E. Ricks *Foreign Policy Blog*, 11 March 2014. http://ricks.foreignpolicy.com/posts/2014/03/11/we_have_met_the_enemy_and_he_is_us_a_possible_4_step_recovery_program_for_pme (accessed 30 July 2014).
- European Committee for Standardization. *European Guide to Good Practice in Knowledge Management: Part 1: Knowledge Management Framework*. Brussels: CEN, March 2004. http://enil.ceris.cnr.it/Basili/EnIL/gateway/europe/CEN_KM.htm (accessed 23 July 2014).

- Evans, Ryan, and Jason Fritz. "A Conversation with the Chairman: General Martin E. Dempsey." *War on the Rocks*, 25 February 2014. <http://warontherocks.com/2014/02/a-conversation-with-the-chairman-general-martin-e-dempsey/> (accessed 31 July 2014).
- Goodenough, Patrick. "Assad Warns West About Terror Blowback As U.S. Sends More Troops to Jordan." *Cybercast News Service*, 18 April 2013. <http://cnsnews.com/news/article/assad-warns-west-about-terror-blowback-us-sends-more-troops-jordan> (accessed 4 August 2014).
- Hammes, Thomas X. "Dumb-dumb bullets: As a decision-making aid, PowerPoint is a poor tool." *Armed Forces Journal* (1 July 2009). <http://www.armedforcesjournal.com/essay-dumb-dumb-bullets/> (accessed 28 July 2014).
- McMaster, H. R. "Studying War and Warfare." *War Council Blog*, 13 January 2014. <http://www.warcouncil.org/blog/2014/1/11/studying-war-and-warfare-by-major-general-hr-mcmaster> (accessed 29 May 2014).
- Odierno, Raymond T. "Amid Tighter Budgets, U.S. Army, Rebalancing and Refocusing: A Conversation with Raymond T. Odierno." Interview by James Sciutto. Council on Foreign Relations, 11 February 2014. <http://www.cfr.org/united-states/amid-tighter-budgets-us-army-rebalancing-refocusing/p32373> (accessed 25 April 2014).
- Odierno, Raymond T., James F. Amos, and William H. McRaven. *Strategic Landpower: Winning the Clash of Wills White Paper*, 2013. <http://www.tradoc.army.mil/FrontPageContent/Docs/Strategic%20Landpower%20White%20Paper.pdf> (accessed 20 May 2014).
- Odierno, Raymond T., John M. McHugh, and Raymond F. Chandler, III. *Army Leader Development Strategy 2013*. United States Army Combined Arms Center. <http://usacac.army.mil/cac2/CAL/repository/ALDS5June%202013Record.pdf> (accessed 13 May 2014).
- Petraeus, General David. Quoted in Babak Dehghanpisheh. "Scions of the Surge." *Newsweek*, 15 March 2008. <http://www.newsweek.com/how-iraq-war-changes-us-officers-83711> (accessed 22 July 2014).
- "Syria's Alawites, a secretive and persecuted sect." Reuters, 31 January 2012. <http://www.reuters.com/article/2012/01/31/us-syria-alawites-sect-idUSTRE80U1HK20120131> (accessed 10 June 2014).
- The World Bank "Syrian Arab Republic Data." The World Bank Group. <http://data.worldbank.org/country/syrian-arab-republic> (accessed 10 June 2014).

Other Sources

- Christia, Fotini. "What Can Civil War Scholars Tell Us About the Syrian Conflict?" *POMEPS Briefing 22*. Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, 18 December 2013.
- Downes, Alexander. "Why Regime Change is a Bad Idea in Syria." *POMEPS Briefing 22*. Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, 18 December 2013.
- Group 1 (Spring Elective). PowerPoint Presentation. U.S. Army Command and General Staff College, Fort Leavenworth, KS, 2013.
- Group 2 (Fall Elective). PowerPoint Presentation. U.S. Army Command and General Staff College, Fort Leavenworth, KS, September 2013.
- Group 4 (Common Core). Whiteboard Work. U.S. Army Command and General Staff College, Fort Leavenworth, KS, Fall 2014.
- Group 5 (LDW). PowerPoint Presentation. U.S. Army Command and General Staff College, Fort Leavenworth, KS, January 2014.
- Perez, Celestino, Jr. "High-Stakes Political Judgment: An Analytically Eclectic Framework for *Thinking What We are Doing*." A paper presented at the 70th Annual Meeting of the Midwest Political Science Association, 5 August 2012.
- _____. "A New Approach to Doing Military Ethics." In *Handbook on Research Methods in Military Studies*, edited by Joseph Soeters, Patricia Shields, Sebastiaan Rietjens. New York: Routledge Press, 2014.
- Schulhofer-Wohl, Jonah. "Fighting Between Allies and the Civil War in Syria." *POMEPS Briefing 22*. Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, 18 December 2013.
- Sheets, Houston. "An Abductive Reasoning Model for the Military Practitioner Operating Overseas." A paper submitted on as a partial requirement for graduation from the Local Dynamics of War Scholars Program, 2 December 2013.
- Staniland, Paul. "Insurgent Organization and State-Armed Group Relations: Implications for Syria." *POMEPS Briefing 22*. Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, 18 December 2013.
- Student Handout for CGSOC Elective. U.S. Army Command and General Staff College, Fort Leavenworth, KS, 2013.

Student Handout for CGSOC Scholar's Program. U.S. Army Command and General Staff College, 2014.

Student Text 22-2, *Writing and Speaking Skills for Army Leaders*. U.S. Army Command and General Staff College, January 2009

Walter, Barbara F. "The Four Things We Know About How Civil Wars End." *POMEPS Briefing 22*. Washington, DC: Project on Middle East Political Science, Institute for Middle East Studies, George Washington University, 18 December 2013.