THE MILITARY DECISION MAKING PROCESS: MAKING BETTER DECISIONS VERSUS MAKING DECISIONS BETTER

A Monograph

by

Major John J. Marr
United States Army

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term, AY 2000-2001

REPORT DOCUMENTATION PAGE

1. REPORT DATE (DD-MM-YYYY) 01-01-2001	**2. REPORT TYPE** monograph	**3. DATES COVERED (FROM - TO)** xx-xx-2000 to xx-xx-2001

4. TITLE AND SUBTITLE THE MILITARY DECISION MAKING PROCESS: MAKING BETTER DECISIONS VERSUS MAKING DECISIONS BETTER Unclassified	**5a. CONTRACT NUMBER**
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S) Marr, John J. ;	**5d. PROJECT NUMBER**
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME AND ADDRESS USA Command & General Staff College School of Advanced Military Studies 1 Reynolds Ave. Fort Leavenworth , KS 66027	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS ,	**10. SPONSOR/MONITOR'S ACRONYM(S)**
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

A
PUBLIC RELEASE

,

13. SUPPLEMENTARY NOTES

14. ABSTRACT
This monograph examines the Military Decision-Making Process (MDMP) as presented in the 1997 version of FM 101-5, Staff Organization and Operations. Numerous military professionals and decision-making theorists hold that an analytical process such as the MDMP is inappropriate for tactical operations. Officers supporting this line of reasoning suggest that the tempo and uncertainty of the brigade/battalion fight calls for an intuitive decision-making process. Through a detailed analysis of what the MDMP is theoretically designed to accomplish, this monograph provides evidence to counter this criticism. The structure of the paper provides this evidence by first establishing the validity of using an analytical model in the tactical environment, and then demonstrating that the MDMP is the right analytical model. The first part of the paper, an examination of the MDMP in the context of problem-solving theory, suggests that an analytical planning process is needed to support future intuitive decisions. This justifies the use of the use of the MDMP?s analytical processes, answering the first question. The second part of the paper determines whether the MDMP is the right analytical model. The paper accomplishes this by examining the MDMP against two sets of criteria. The first set, are planning imperatives suggested by historical doctrine. The second set represents the psychological processes that human decision-makers need to overcome the combined friction of the tactical environment. Together, these two sets of criteria explain how the MDMP is an appropriate analytical model, which answers the second question. This monograph suggests that command and control at the tactical level represents a system where analytical planning is necessary for successful intuitive decision-making. The MDMP meets the U.S. Army?s institutional expectations, represented by the planning imperatives of historical doctrine. Additionally, the MDMP provides tactical commanders a useful method for counteracting the psychological traps and biases inherent in all human decision-making. Therefore, as an analytical planning tool, the current MDMP is appropriate for tactical operations.

15. SUBJECT TERMS
Military Decision-Making Process (MDMP); command and control

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 79	19a. NAME OF RESPONSIBLE PERSON Burgess, Ed burgesse@leavenworth.army.mil
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER **International Area Code** **Area Code Telephone Number** 913 758-3171 DSN 585-3171

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Major John J. Marr

Title of Monograph: **The Military Decision Making Process: Making Better Decisions Versus Making Decisions Better**

Approved By:

_____   Monograph Director
Lieutenant Colonel Wade Rush

_____   Director, School of Advanced
Colonel Robin P. Swan   Military Studies

_____   Director, Graduate Degree Program
Phillip J. Brookes, Ph.D.

Accepted this _____ day of _____ 2000

ABSTRACT

THE MILITARY DECISION-MAKING PROCESS: MAKING BETTER DECISIONS VERSUS MAKING DECISIONS BETTER, by Major John J. Marr, USA, 68 pages.

This monograph examines the Military Decision-Making Process (MDMP) as presented in the 1997 version of *FM 101-5, Staff Organization and Operations*. Numerous military professionals and decision-making theorists hold that an analytical process such as the MDMP is inappropriate for tactical operations. Officers supporting this line of reasoning suggest that the tempo and uncertainty of the brigade/battalion fight calls for an intuitive decision-making process. Through a detailed analysis of what the MDMP is theoretically designed to accomplish, this monograph provides evidence to counter this criticism.

The structure of the paper provides this evidence by first establishing the validity of using an analytical model in the tactical environment, and then demonstrating that the MDMP is the right analytical model. The first part of the paper, an examination of the MDMP in the context of problem-solving theory, suggests that an analytical planning process is needed to support future intuitive decisions. This justifies the use of the use of the MDMP's analytical processes, answering the first question. The second part of the paper determines whether the MDMP is the right analytical model. The paper accomplishes this by examining the MDMP against two sets of criteria. The first set, are planning imperatives suggested by historical doctrine. The second set represents the psychological processes that human decision-makers need to overcome the combined friction of the tactical environment. Together, these two sets of criteria explain how the MDMP is an appropriate analytical model, which answers the second question.

This monograph suggests that command and control at the tactical level represents a system where analytical planning is necessary for successful intuitive decision-making. The MDMP meets the U.S. Army's institutional expectations, represented by the planning imperatives of historical doctrine. Additionally, the MDMP provides tactical commanders a useful method for counteracting the psychological traps and biases inherent in all human decision-making. Therefore, as an analytical planning tool, the current MDMP is appropriate for tactical operations.

TABLE OF CONTENTS

CHAPTER 1

Introduction

"A man has to ignore much in order to get on with something." [1]

- A.H. Whitehead

Problem Background

To impose their will on the enemy in the close fight, U.S. Army brigade and battalion commanders must make many decisions – before, during, and after the fight begins. The tangible embodiment of these decisions is the purposeful arrangement in time and space of the commander's forces. In order to accomplish *all* decision-making effectively, the Army has armed these tactical commanders, and their supporting staff officers, with a *single* problem-solving tool, the Military Decision Making Process (MDMP).[2]

The environment in which tactical commanders routinely employ this "tool" is the realm of combat. The combat environment, meaning actual armed conflict (or the training in preparation for armed conflict), is characterized by elements of uncertainty, danger, and violence, which result from the interaction with a free-thinking opponent. Furthermore, combat is marked by periods of greater or lesser interaction between opposing forces, which vary the amount of time and information available to opposing commanders. Usually, the victor in this environment is the commander who is able to make better decisions, faster.[3]

The theories, methods, and procedures of solving problems – and making decisions – are items of critical interest to the present day U.S. Army officer. Military professionals have analyzed a wide variety of theories in their research for better, faster decisions.[4] Regardless of this analysis and research, the Army's doctrine currently employs a problem-solving process, which has not fundamentally changed in nearly 100 years.[5]

Furthermore, unit performance at the U.S. Army's combat training centers (CTCs) suggests that tactical units have difficulties in applying the MDMP. Empirical evidence and observer-controller remarks reflect trends that demonstrate fundamental split between a staff's ability to plan and a commander's ability to make decisions during actions in contact with the enemy.[6] The apparent result is that tactical units inflexibly fight their plans, and not the enemy. This paper seeks to determine what causes this inflexibility.

Analysis of historical doctrine, including every version of *FM 101-5, Staff Organization and Operations* and *FM 100-5, Operations* since 1941, suggests a theoretical split in the decision-making actions of tactical commanders. In short, U.S. Army doctrine has traditionally directed commanders to plan for operations using the MDMP, and subsequently use their experience and intuition to guide their actions after crossing the line of departure. This apparent dichotomy is analyzed in Chapter 2.

An understanding of problem-solving theory provides an answer to this dichotomy – there are different *types* of problems. The existence of different types of problems suggests that certain decision-making techniques are more effective, given certain situational factors. This explains why there are different types of decision-making models – the particular methods and techniques that humans (and organizations) employ to solve problems.

When considered in the context of combat at the tactical level, the fact that different problems require different decision-making models appears to explain the dichotomy seemingly posed by historical doctrine. This understanding is the result of approaching tactical decision-making from a systems-view.

When viewed as a system, tactical combat represents an 'environmental dichotomy' that parallels the two suggested methods of decision-making proposed by historical doctrine. When there is time enough, and the situation is complex enough, commanders use the MDMP to make decisions. This is tactical planning. Conversely, when time is short, but the situation is familiar enough to tactical leaders to allow them to make decisions based on gut-feelings or trained

response, they decide intuitively. This is combat-action decision-making. Viewed in this manner, problem-solving theory and a systems-perspective of the tactical level of war align with the Army's historically based institutional knowledge. Chapter 3 examines problem-solving theory and establishes a detailed model of the tactical command and control system.

Unfortunately, this explanation begs a serious question. If this interpretation of doctrine and problem-solving theory is correct, why does the Army's doctrine not establish two decision-making processes, one aligned with tactical planning, and another for combat-action decision-making? Once again, problem-solving theory provides an answer.

Problem-solving theory suggests that the various categories of problems differ according to time, information, and solvability. The dissimilar amounts of time, information, and personnel available at different points in tactical combat explain the fundamental differences between tactical planning and combat-action decision-making. Furthermore, problem-solving theory suggests that an initial decision, in a given context, can affect subsequent decisions. In other words, decisions made during tactical planning (i.e. a course of action) and the combat-action decisions required in the execution of that plan are inexorably linked. The selection of a course of action represents the selection of a "set" of combat-action decisions that are integrated into the plan. Therefore, the use of two *separate* processes might be counterproductive.

Given this analysis, it appears imperative that planners focus the majority of their efforts on preparing their commanders for combat-action decisions - decisions often vital to ensuring mission success. Therefore, the relevant question becomes: "does the MDMP adequately prepare tactical commanders for future combat-action decisions?" If staffs applied the same process to making better future decisions, and anticipating the commander's needs throughout the battle, would they develop flexible and relevant plans? Perhaps the problem is one of focus, rather than procedure.

Problem Statement and Scope

This research examines whether usage of the MDMP, as published in the current (1997) version of FM 101-5, during the U.S. Army tactical planning process enhances the ability of brigade and battalion commanders to make combat-action decisions.   As a decision-making model, the MDMP employs an analytical approach to examining the situation, developing and comparing courses of action, and eliciting a commander's decision in order to produce an operation order – a process that takes considerable time. However, all of these actions occur in a fast changing and uncertain environment. Does the MDMP fit?

Answering this question necessitates several things. First, it requires an examination of the MDMP itself, and the historical process of its development. This provides a historically based context for understanding *what* is being analyzed. Second, an answer to this question requires an understanding of the separate elements of the overarching tactical command and control system within which units operate, including the roles of decision-making models, the commander and staff, and the environment of tactical operations. Analysis of this system establishes the framework necessary for understanding how tactical units are organized to conduct problem-solving. Third, answering this question requires examination of how the U.S. Army's keystone doctrine describes good planning. [7] Lastly, it requires an examination of the human element of decision-making. This paper explores all of these aspects of the problem.

The scope of this paper is limited to the tactical environment and operations of U.S. Army brigades and battalions. Although the implications of this research apply at other levels, this reduction in scope is made for two reasons. First, it focuses research on the tactical levels where the impact of timeliness in problem-solving is most acute. Second, this reduction in scope simplifies research – the experience levels of decision-makers at the brigade and battalion levels, and the size/composition of the supporting staff members are similar.

A survey of commanders or an experiment including an active unit is beyond the limits of this research in exploration of this hypothesis. Therefore, this research involves a detailed

analysis of literature from a variety of research fields and military sources, including cognitive

psychology, problem-solving and decision-making theory, learning theory, expertise theory, U.S.

Army keystone doctrine, and the writings of current military professionals.[8]

Thesis Statement

The current MDMP *is* an appropriate tool for the conduct of tactical planning, and *when*

employed correctly, it enhances the ability of tactical commanders to make combat-action

decisions. The MDMPs congruence with keystone doctrine and the cognitive needs of

commanders establishes this justification. Justification of this hypothesis is the purpose of this

paper.

To answer this question, this paper's research (Chapters 4 and 5) focuses on employment of

the MDMP in both sides of the tactical combat system – tactical planning and combat-action

decision-making. Therefore, analysis and assessment considers two sets of criteria. These sets

focus on the institutional learning of the Army, and the human dimensions of decision-making.

The first set leverages the many hundreds of years of experience reflected in the U.S. Army's

keystone doctrine. The second set reflects what research by cognitive psychologists reveals as

important to commanders. The two sets of criteria are listed at figure 1 (below.)

EVALUATION CRITERIA

MDMP in Tactical Planning	MDMP and the Commander's Needs
Flexibility	Battlefield Visualization
Timeliness	Monitoring
Effectiveness	Time-space Conceptualization
Focused Analysis	Objective Dialogue

Figure 1 – Evaluation Criteria

This monograph concludes with suggestions of why military professionals misapply the

MDMP and why it is so misunderstood. These suggestions include recommendations for correct

application and training of the MDMP, and areas that require further research.

Assumptions

This research includes the following assumptions. These assumptions help illustrate the focus and intent of the analysis applied.

First, this research incorporates the premise that commanders are experts. Research by the U.S. Army Research Institute on battle command employs this same assumption and it is a critical underlying factor implied by intuitive decision-making theories. For purposes of this research, commanders are experts, in that they have knowledge, skills/abilities, aptitudes and experience levels higher than their subordinates do and higher than officers of the same rank not selected for command.[9]

Second, this research assumes that the content of information always exceeds the process of transferring information in terms of importance. In other words, the *what* is more important than the *how*. For this reason, the technical aspects of how commanders pass and receive information are not relevant to this research.

Third, and last, this research assumes that making decisions quickly is important. The importance of rapid decision-making is clearly established in U.S. Army doctrine, and contemporary military literature. In essence, "warfighting is…time competitive."[10]

---

[1] William Reitzel, *Background to Decision-Making*, (Newport, RI: Naval War College), 1958, cover.

[2] U.S. Army. *Field Manual 101-5, Staff Organization and Operations*. (Washington, D.C.: Headquarters, Department of the Army), 1997, 5-1.

[3] Ibid, C-1.

[4] For examples of this research see: Nancy C. Roberts, *New Directions for Military Decision Making Research in Combat and Operational Settings*, (Monterey: Naval Postgraduate School, 1992), and Lloyd M. Crumbley and Mitchell B. Sherman, *Review of Command and Control Models and Theory*. Technical Report 915. (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 1990).

[5] Rex R. Michel, *Historical Development of the Estimate of the Situation*. Research Report 1577. (Fort Leavenworth: U.S. Army Research Institute for the Behavioral and Social Sciences, October 1990), 3, NTIS, AD-A230 562, 3-4.

[6] Gregory D. Reilly, "How Tactical Experience Affects Confidence About Combat Decision Making," (Masters Thesis for the U.S. Command and General Staff College, Fort Leavenworth, KS), 1997, 4; and Jon Grossman, *Battalion-Level Command and Control at the National Training Center*, (Santa Monica: Rand), 1994, 1-2.

[7] U.S. Army doctrine is "the authoritative guide to how Army forces fight wars and conduct operations…" (FM 100-5 [1993], ii.) Doctrine is authoritative, but not prescriptive. This means that doctrine provides historically based principles for the establishment of common actions among all soldiers, but that commanders are not limited or restricted from any actions.

The U.S. Army derives its keystone doctrine from *FM 100-5, Operations* (1993). However, currently the U.S. Army's keystone doctrine is in a period of transition. The year 2000 edition of *FM 3-0, Operations*, stands poised to replace the 1993 version of *FM 100-5*. Both the Army's Command and General Staff College and School for Advanced Military Studies use the FM 3-0 as a doctrinal reference. Therefore, for the purposes of this research, the term keystone doctrine refers interchangeably to *FM 100-5* and *FM 3-0*.

U.S. Army. *Field Manual 100-5, Operations.* (Washington, D.C.: Headquarters, Department of the Army), 1993, ii; U.S. Army. *Field Manual 3-0, Operations,* (DRAG Edition). (Washington, D.C.: Headquarters, Department of the Army), 2000, 1

[8] *Cognitive psychology* refers to the academic discipline concerned with the field of study that includes problem-solving, decision-making, and information processing. (Stanley M. Halpin, *The Human Dimensions of Battle Command: A Behavioral Science Perspective on the Art of Battle Command*, (Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences), 1996, 13.)

Decision-making is "knowing if…when, and what to decide. Decisions are the means by which the commander translates his vision into action. [It is] both a science and an art." (*FM 101-5, Staff Organization and Operations*, 1997, 5-1) *Combat-action* decisions are defined as the decisions made after a unit has published its operations order, and 'crossed the line of departure.' Chapter 3 includes a detailed analysis of these two concepts.

Planning is "the means by which the commander envisions a desired outcome, lays out effective ways of achieving it, and communicates to his subordinates his battlefield visualization." (*FM 3-0, Operations,* 6-1). *Tactical planning* is defined as the development of multiple options based on a thorough analysis by the entire staff, resulting in an informed decision (course of action).

Battle Command is the "exercise of command in operations against a hostile, thinking opponent." (*FM 3-0, Operations,* 5-1). Through *battle command*, commanders, assisted by the staff, visualize, describe, and direct the actions of subordinates.

[9] Stanley M. Halpin, *The Human Dimensions of Battle Command: A Behavioral Science Perspective on the Art of Battle Command*, (Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences), 1996, 13; Gary Klein, *Making Decisions in Natural Environments*, (Alexandria: U.S. Army Research Institute for Behavorial and Social Sciences), 1997, 2.

[10] Charles T. Rogers, "Intuition: An Imperative of Command," *Military Review*, March 1994, 43.

CHAPTER 2

The Military Decision Making Process

We, like the other combat units, determined our objectives, gathered as best we could the data required, analyzed the data, considered alternatives, and made decisions. These analyses were as detailed as one might expect in a combat environment, but they were not sophisticated.

LTG Julian Ewell and MG Ira Hunt, *Sharpening the Combat Edge*

To begin an analysis of the MDMP necessitates answering two basic questions: what is the MDMP, and how did the U.S. Army come about developing it? Answering the first question provides an understanding of what the process does, and how doctrine intends it to work. An answer to the second question provides an understanding of the historical context and foundation of the process. This chapter considers both of these questions, creating a conceptual starting point for research.
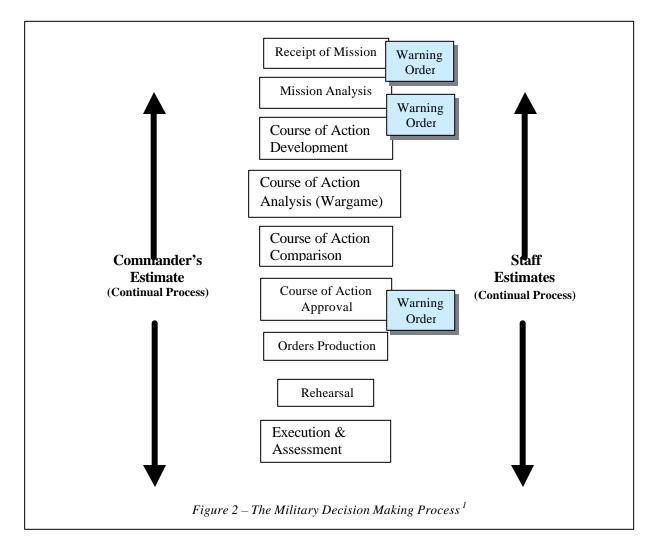
In answering these two questions, this chapter also reveals an apparent dichotomy in the way that U.S. Army keystone doctrine describes decision-making. Current and past versions of *FM 100-5, Operations*, reflect emphasis on both analytical and intuitive processes. However, as noted previously, the MDMP – an analytical model – is the only 'tool' provided by doctrine.

This chapter begins with an examination of the current (1997 version) of the MDMP, as outlined in *FM 101-5, Staff Organization and Operations*. The second section of the chapter provides a brief outline of the MDMP's history emphasizing the historical influence of keystone doctrine and the apparent emphasis on both analysis and intuition. The chapter summary discusses the implications of this apparent dichotomy on the present research.

The MDMP as a Problem-Solving Model

The MDMP is an analytical process, employing a time-intensive, but logical sequence to analyze the situation, develop a range of options, compare these options, and then select the

option that best solves the problem. The option selected becomes the tactical plan; the commander's decision on how he will arrange his forces in time and space to accomplish his purpose. The commander is the decision-maker, however, the process often depends on the efforts of a team – the staff – especially during the analysis and development of options phases.

	Receipt of Mission	Warning Order
	Mission Analysis	Warning Order
	Course of Action Development	
Commander's Estimate (Continual Process)	Course of Action Analysis (Wargame)	Staff Estimates (Continual Process)
	Course of Action Comparison	
	Course of Action Approval	Warning Order
	Orders Production	
	Rehearsal	
	Execution & Assessment	

Figure 2 – The Military Decision Making Process [1]

FM 101-5 (1997) describes the MDMP as a "single, established, proven, analytical process" that "helps the commander and staff examine a battlefield situation and reach logical decisions."[2] Although admittedly time-consuming, the process ensures that planners incorporate "thoroughness, clarity, sound judgment, logic, and professional knowledge." The process integrates the actions of the commander and his entire staff, and emphasizes detail in order to "minimize [the] risk of overlooking critical aspects of the operation."[3] The model above depicts

the cyclical and continuous nature of the process and its accompanying commander and staff estimates; the process continues "at all levels" through execution until the situation demands a re-assessment or the unit receives a new mission.[4]

Receipt of Mission starts the process, and is the step where the unit frames their problem temporally and spatially, by making an initial estimate of time available, and determining the context and location of the mission. *Mission Analysis,* probably the most crucial step, is where the unit actually defines the problem by conducting a full situational analysis – including the generation of possible enemy options, establishing the commander's intent, and verbalizing the "problem" in the form of a mission statement. This step is critical to establishing a common, shared understanding of the problem. *Course of Action Development* is where the unit generates ideas (courses of action - COAs) for solving the problem, and usually results in a visual display of the problem in the form of a COA sketch. During *COA Analysis,* the staff further refines this graphic display, and validates their options by applying them to an interactive test by wargaming the full range of friendly options against the full range of enemy options. This step is also integral to developing the shared vision of the commander and staff. In *COA Comparison*, the staff applies a logical, dialectical process in order to determine their recommendation for the commander on which COA (decision-set) to select. Once the commander receives the COA briefing, and approves the COA (*COA Approval*), the unit moves on to the *Orders Production* step; refining and writing the official order for the subordinate elements.

In addition to the MDMP's analytical structure and format, one additional doctrinal concept is integral to this research. This concept concerns the doctrinal viewpoint for when and how units should use the MDMP. Understanding this concept provides a better understanding of the flexibility inherent in the current MDMP format.

Stated succinctly, current doctrine establishes the MDMP as a framework for initial tactical planning, and encourages commanders to modify the process according to the particular situation. *FM 101-5* specifies that the full MDMP "typically occurs when developing the commander's

10

estimate and operations plans, when planning for an entirely new mission…" and should only be "used when adequate planning time and sufficient staff support are available…"[5] The doctrine clearly states that the "commander is in charge" of the MDMP, and he "decides what procedures to use in *each situation*," [this author's italics.], and even offers four different techniques for shortening the process.[6] However, as a reflection of the combined knowledge and experience of literally thousands of combat-tested officers, the doctrine adds a stern warning: "There is still only one process…omitting steps of the MDMP is not the [ideal] solution."[7]

History of the MDMP

The current use of a single, analytical process for tactical decision-making appears ironic in light of the history of the MDMP and the keystone doctrine upon which it is based. *FM 100-5, Operations* provides the doctrinal foundation for the employment of Army forces in combat and the planning of tactical missions. As such, *FM 100-5* is the source document for *FM 101-5*, which outlines the MDMP.[8] Throughout its many versions, *FM 100-5* consistently emphasizes the need for commanders to employ analytical *and* intuitive decision-making skills.

Historical versions of FM 100-5 clearly establish the paramount importance of the MDMP. The MDMP reflects almost 100 years of institutional learning and experience of the U.S. Army. The current process is an updated version of an analytical decision-making model originally adopted in 1960, which traces its origins to the Estimate of the Situation process – Army doctrine since 1910.[9] This original Estimate process borrowed heavily from late 19th/early 20th Century Prussian General Staff's processes, which the Prussians developed in order to systematize military thought, and to deal with the complexities of modern warfare, and its inherent mobilization requirements.[10]

However, both the format and content of *FM 100-5* demonstrate an apparent dichotomy of emphasis on both analytical and intuitive decision-making. Until 1983, the format of every version of *FM 100-5* included an entire section devoted to "command in battle," separate from

and in addition to its discussion on tactical planning.[11] Likewise, in terms of content, historical versions of keystone doctrine advised commanders to recognize both the need for "decisive action" in contact with the enemy, and "careful planning and anticipation" before contact.[12] Although the importance of intuitive decision-making appeared to decline in the 1983 and 1986 versions of *FM 100-5* with the deletion of the 'command' chapters, the emphasis on intuitive processes resurfaced in several influential non-doctrinal sources.[13]

The history of the MDMP, reflective of heavy influence from *FM 100-5*, demonstrates a parallel trend. From 1940 until 1983, the format of *FM 101-5* included separate chapters on 'planning' and 'decision-making.'[14] Planning chapters reflected the "series of steps" used to analyze missions and decide on courses of action, while decision-making chapters included discussion on the importance of experience and judgment.[15] Clearly, historical versions of both *FM 100-5* and *FM 101-5* acknowledge the importance of both analysis and intuition to decision-making.

Current keystone doctrine, as reflected in both the 1993 version of *FM 100-5* and the 2000 publication of *FM 3-0 (DRAG)* continues this dichotomous emphasis. Starting in the 1993 version of FM 100-5, keystone doctrine concentrated its views on intuitive decision-making into the concept of 'battle command," while maintaining its position on the need for using the analytical MDMP. FM 3-0 further establishes the dichotomy in two significant ways. First, it expands the concept of 'battle command' into an entire chapter, defining it as the process by which commanders visualize, describe, and direct forces in combat. Second, FM 3-0 describes the conduct of tactical fighting as a cyclical system of planning, preparing, executing, and assessing missions. In the explanation of this process, FM 3-0 specifies both the use of the MDMP to provide commanders a "logical sequence" for decision-making, and the need for intuitive decision-making skills.

Summary

The U.S. Army's keystone doctrine, both historical and current, clearly illustrates the need for analytical and intuitive decision-making processes in tactical combat. As keystone doctrine represents the "foundation for the development of tactics, techniques, and procedures," there is a natural expectation that doctrinal solutions would exist to account for both processes.[16] However, current doctrine only provides one – the analytical MDMP.

The establishment of a single model as the answer for all tactical problems suggests a one-dimensional view to decision-making. In other words, the application of a single decision-making model infers that all tactical problems are the same. However, as subsequent research into problem-solving theory demonstrates, this is not the case. The next chapter shows that there *are* different types of problems, which drive the use of different types of decision-making.

---

[1] U.S. Army. *Field Manual 101-5, Staff Organization and Operations.* (Washington, D.C.: Headquarters, Department of the Army), 1997, 5-2.

[2] Ibid, 5-1

[3] Ibid.

[4] Ibid.

[5] Ibid, 5-1.

[6] Ibid, 5-1 and 5-27/28.

[7] Ibid. *FM 101-5* (1997, p.5-27) notes that "inflexible process[es] used in all situations will not work," and that "the MDMP is a sound a proven process that must be modified…to be effective when time is limited." Furthermore, a subsequent section adds: "The process is abbreviated any time there is too little time for its thorough and comprehensive application." The apparent goal is to use the process, as outlined in *FM 101-5* as the proven, ideal goal or model, and then alter the execution of the process as the situation demands.

[8] Until the 1990's, the Army published a new version of the *FM 101-5* to accompany each new version of *FM 100-5, Operations.* Since 1940, the Army has rewritten and re-published *FM 100-5* ten times: in 1940, 1944, 1949, 1954, 1962, 1968, 1976, 1982, 1986, and 1993. Until the 1986 version of *FM 100-5*, the publication of each of these manuals was followed closely by an update of *FM 101-5*. This parallel process of publication stopped in 1984 when *FM 101-5* was not re-published again until 1997.

[9] Michel, *Historical Development,* 15.

[10] Ibid, 3. See also: James D. Hittle, *The Military Staff: Its History and Development.* (Westport: Greenwood Press, Publishers), 1975, 75-76. Hittle discusses the impact of modernization in chapter 2.

[11] U.S. Army. *Field Manual 100-5, Operations.* (Washington, D.C.: Headquarters, Department of the Army), 1976, i. In 1976, the chapter previously title "Command," became "How to Fight." Content covered remained the same.

[12] U.S. Army. *Field Manual 100-5, Operations.* (Washington, D.C.: Headquarters, Department of the Army), 1941, 21 and 24.

[13] The first source was a student text used by the U.S. Army's Command and General Staff College to assist in teaching the decision-making process, *Student Text (ST) 100-9*. During the 13-year period between the 1984 and 1997 versions of *FM 101-5*, this text was re-written ten times, and with each subsequent edition, it further re-defined the MDMP[13]. *ST 100-9* introduced several new decision-making processes – Combat Decision-Making (CDMP), Deliberate Decision-Making (DDMP), and Quick

Decision-Making (QDMP) – each differentiated by the amount of time available, and emphasis on the need for intuitive decisions.   Although admittedly not a true doctrinal manual, forces in the field recognized and appreciated the compelling utilitarianism of these different processes, and in the absence of an updated FM 101-5, ST 100-9 became an authoritative source. (ST 100-9, *The Command Estimate*, (Fort Leavenworth: U.S. Army Command and General Staff College), 1993, 1-1 to 1-5.)

        The second source was a publication from the Battle Command Battle Laboratory (BCBL), entitled *Battle Lab (BL) Pamphlet 2.1, Battle Command*, and its accompanying (pocket-sized) *Battle Command Techniques and Procedures (TTP) Handbook*. Written by BCBL to assist "brigade and battalion-task force commanders…[in] the planning, preparation, and execution of tactical operations," the *Battle Command TTP Handbook* used *ST 100-9* as its source document, and provided combat training center validated techniques for employing the three new "decision-making methodologies," CDMP, DDMP, and QDMP.   Although this source was also non-doctrinal, it received wide dissemination; the *Handbook* was given to new battalion and brigade commanders attending the Army's pre-command course at Fort Leavenworth. (U.S. Army Battle Command Battle Laboratory, *Battle Command Techniques and Procedures: A Commander's Guide for the Coordination and Employment of Battlefield Operating Systems*, (Fort Leavenworth, BCBL), 1995, 2-15 to 2-19.)

[14] Editions before the 1968 version called this second chapter "The Estimate of the Situation."

[15] For example see: U.S. Army. *Field Manual 101-5, Staff Organization and Procedure.* (Washington, D.C.: Headquarters, Department of the Army), 1968, 6-1 and 7-1.

[16] *FM 3-0, Operations (DRAG)*, v.

CHAPTER 3

The Tactical Command and Control System

Man is the fundamental instrument in war; other instruments may change but he remains relatively constant. Unless his behavior and elemental attributes are understood, gross mistakes will be made in planning operations and in troop leading.

FM 100-5, Operations (1941)

Resolving the apparent dichotomy suggested by keystone doctrine's split emphasis on both analytical and intuitive decision-making requires viewing tactical command and control (tactical C2) as a system. The larger, holistic context of tactical C2 – illustrated through a systems approach – reveals that units apply analytical and intuitive decision-making through two separate cognitive processes: tactical planning and combat-action decision-making. The theoretical construction and explanation of such a system is the purpose of this chapter.

A systems-viewpoint of tactical C2 is relevant to this analysis because it prevents the unnatural separation of the MDMP from the overall context of tactical combat. In general, a systems-oriented viewpoint facilitates "seeing interrelationships, rather than linear cause-effect chains."[1] Therefore, evaluation of the MDMP must account for the humans that employ it, and the nature of the situations in which they use it.

Viewing tactical C2 as a system enables an understanding of two points critical to this research. First is how the MDMP fits inside the tactical C2 system. Second is how courses of action represent 'sets' of decisions. Comprehension of these two points provides the justification for use of an analytical decision-making model during tactical planning.

An understanding of the construct of this tactical C2 system-model necessitates an explanation of two concepts. The first concept is the interrelationship of problem-solving theory and decision-making models, and the second concept is an understanding of the environment of tactical combat. The first two sections of this chapter address these concepts, and the third

section combines this analysis into the construct of a model that explains the over-arching tactical C2 system.

Problem Solving Theory

The stated purpose of this paper is to determine if the MDMP enhances combat-action decision-making. As noted in Chapter 1, it is first necessary to establish the relationship between the MDMP, tactical planning, combat-action decision-making, and the over-arching tactical C2 system of which they are parts. An understanding of this system, therefore, logically begins with an analysis of what the MDMP is theoretically designed to accomplish. This necessitates an understanding of problem-solving theory.[2]

Problem-solving theory describes the mental processes by which human beings react to changes in their environment; especially those changes which require a "process of choice which leads to action" – a decision – by the human in question.[3] Problem-solving theory explains the overall context for how human beings recognize, decide, and develop solutions to resolve conflict in a particular situation. The basic problem-solving model consists of five steps: 1) "clarifying, stating or defining the objective, 2) search-analysis (identification of the problem and analysis of current state), 3) creation and testing of possible solutions, 4) decision, and 5) implementation of solution."[4]

The significance of problem-solving theory to an analysis of the MDMP is that it establishes the theoretical framework that drives the development and use of different decision-making models. It describes the nature and types of problem situations, the ways that different problems affect decision-making, and the ways different problems affect the accomplishment of solutions. Viewed in this way, decision-making is only a single aspect of problem-solving.

Understanding this significance requires a description of the salient points of problem-solving theory, which illustrates how different problem-types drive the selection and use of analytical and intuitive decision-making models. Additionally, it requires an understanding of the problem-solving concepts of 'decision-sets' and 'bounded rationality.' Although these concepts do not

16

directly affect the selection of decision-making models, they are integral to understanding the tactical C2 system described in the last section.

Problem Types

The work of several prominent problem-solving theorists establishes firm criteria for differentiating problem types. These theorists include Herbert Simon, William Reitzel, and David Kolb.[5] An explanation of these problem 'types' provides insight on how different problems drive the selection and use of different decision-making models.

Simon finds it necessary to divide problems into two simplistic categories, based on the amount of time that the problem-solver has to formulate a response. These two categories are *encounter* and *set-piece*. *Encounter* problems "arise because an occasion arises – either is made to occur by the enemy, or by the weather, or by something else – in which action is called for."[6] Set-piece problems occur "in situations in which there is a lot of time to plan out a future course of action."[7]

According to Simon, the significance of this cognitive separation is how time and information (or lack thereof) forces modifications in the basic five-step model identified above. In *encounter* problems, due to time pressures and uncertainties or gaps in information, a single individual employs the problem-solving model. However, set-piece problems lend themselves to group problem-solving, affording the "opportunity for self-correction."[8] Based on these differences, Simon contends that *encounter* problems and *set-piece* problems represent two fundamentally different situations.

Building on Simon's work, theorist William Reitzel adds an additional distinction that separates problem-situations according to their possible outcomes. Terming problem-situations as either *puzzles* or *difficulties*, Reitzel points out that some situations "can…be solved correctly in one way" (*puzzles*), and other situations "can be surmounted, overcome, reduced, avoided, ignored; but…can not be solved" (*difficulties*).[9] In other words, *difficulty* situations have

numerous possible solutions – any of which will work – some "more efficient than others but no one [that is] absolutely and demonstrably correct."[10]

Distinguishing between problems in this way impacts the basic problem-solving model in the same manner as Simon's differentiation between *set-piece* and *encounter* situations. *Puzzles* do not require the comparison of options (step 3), while *difficulty* situations generally require analysis of the realm of possible choices. Reitzel suggests that the "organized collective" methods of military staffs are more appropriate for solving *difficulties*.[11]

David Kolb, whose research focuses on the use of experience in problem-solving situations, offers a third way to distinguish problems. Kolb summarizes problem-solving as an equation containing "three structural components: reality (the current state), the goal, and the "process whereby reality can be transformed to match the goal" (the plan). Kolb denotes this formula as **R g G**, where (**R**) represents reality, (**G**) represents the goal and the (**g**) represents the plan of action. Using the **R g G** formula, Kolb categorizes problem situations according to amount of information about any of the three components.[12]

For example, if a problem-solver understands both the current situation and the intended goal, but is not sure of what to do, Kolb considers this a "*structured* problem, perhaps the most common form of a problem."[13] However, when there is less information about the situation or goal, then it is harder to develop a plan, and the problem is *unstructured*, "and needs to be defined" before the problem-solver can proceed.[14] Kolb suggests that analysis is the key to defining the problem, thereby resolving the *unstructured* nature.
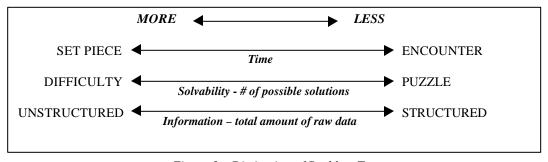

Figure 3 – Distinction of Problem Types

In summary, problem-solving theory describes different types of problems. These 'types' are distinguishable and categorized according to time (*encounter* vs. *set-piece*), solvability (*difficulty* vs. *puzzle*), and information (*structured* vs. *unstructured*) – see figure 3 below. Understanding different problem types enables recognition of how different problem situations establish the conditions for different decision-making models.

Decision-Making Models

Decision-making models are the specific methods, processes, or procedures that an individual (or group) employs to solve a problem. There are many decision-making models – proffered by many scientists, academics, business-experts, psychologists and others.[15] As, the variety of problem 'types' described above suggests, decision-making models are 'type-specific.' Stated simply, decision-making models work best when employed to address the particular 'problem-type' for which they are designed.

There are two primary categories encompassing decision-making models: analytical-comparative and intuitive-naturalistic.[16] Although these two categories have many differences, the primary separation between the two is the use of formalized procedures. Generally, analytical-comparative (analytical) models employ structured methodologies, and intuitive-naturalistic (intuitive) models do not.

Analytic decision-making models apply a "prescribed procedure…in a guided, systematic attempt to analyze a decision and evaluate its components."[17] For example, most analytic processes follow the basic 5-step problem-solving model previously outlined, involving a detailed analysis of the situation, the generation of possible solutions, and the comparison of solutions against a set of objective criteria. Because of the level of detailed work, analytical processes are usually time-consuming, yet thorough.

The level of work involved with generating options and performing detailed analysis also creates two tendencies of analytical models. First, they lend themselves to work by groups of

problem-solvers – this increases the overall ability to analyze and integrate large amounts of information. Second, analytical models tend to focus on selecting the best possible solution – a tendency known as 'optimizing'. The current MDMP is an example of an analytical decision-making model.

Conversely, intuitive decision-making models stress the ability of single, expert decision-makers to make decisions based on personal experience. "The basic idea is that experienced decision-makers [can] reduce the task situation to manageable proportions by converting it into a pattern-recognition problem."[18]

One example, the Recognition-Primed Decision (RPD) Model developed by Gary Klein, describes a process by which decision-makers first match situational "cues" and "patterns" to familiar situations and then select the solution suggested by experience. Klein suggests that intuitive models like RPD provide a closer approximation of how humans actually make decisions.[19] In other words, decision-makers employ RPD as a matter of course, without consciously recognizing the use of any decision-making model. Decision-makers merely use "experience [to] let them see a situation…as an example of a prototype."[20]

Where analytical models emphasize group work and 'optimizing,' intuitive models emphasize the role of a single decision-maker rapidly selecting a workable solution. If the first experience-based solution seems inappropriate, the decision-maker continues mentally evaluating options until finding a solution that works. This process is known as "satisficing."[21] For this reason, the primary "advantage of intuitive decision-making in military operations is its speed."[22]

The common characteristic of intuitive models is that the entire process takes place inside the mind of the decision-maker. In so doing, intuitive models alter the fundamental four-stage problem-solving methodology of defining the objective – analysis of the problem and current state – comparison of possible solutions, and decision. By internalizing the process inside the head of the decision-maker, intuitive models compress, or skip altogether, the 'comparison' step.[23]

A comparison of the two models, within the context of problem-solving theory outlined above, demonstrates that actually each model addresses a different problem 'type.' As figure 4 points out, analytical models facilitate a detailed decision-making process, conducted by groups
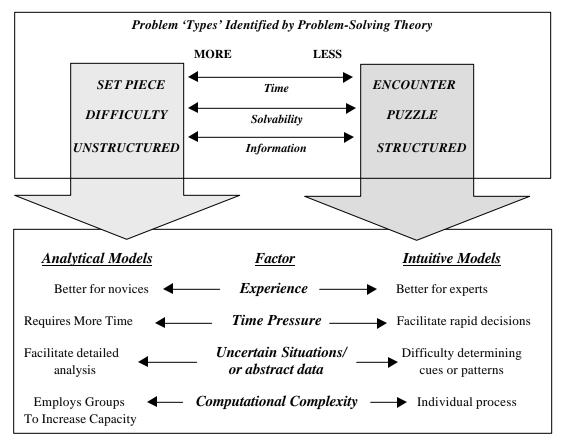

Problem 'Types' Identified by Problem-Solving Theory

	MORE	LESS	
SET PIECE	← Time →		*ENCOUNTER*
DIFFICULTY	← Solvability →		*PUZZLE*
UNSTRUCTURED	← Information →		*STRUCTURED*

Analytical Models	*Factor*	*Intuitive Models*
Better for novices ←	*Experience* →	Better for experts
Requires More Time ←	*Time Pressure* →	Facilitate rapid decisions
Facilitate detailed analysis ←	*Uncertain Situations/ or abstract data* →	Difficulty determining cues or patterns
Employs Groups To Increase Capacity ←	*Computational Complexity* →	Individual process

Figure 4 – Comparison of Analytical and Intuitive Decision Models within the Context of Problem-Solving Theory [24]

of less experienced personnel, when information levels are low, but time is available. This matches the *set-piece, difficulty*, and *unstructured* problem types. On the other hand, intuitive models allow experts in time-sensitive situations to make pattern-based decisions, by themselves, which matches the *encounter*, *puzzle*, and *structured* problem types. Furthermore, as subsequent examination (next section) demonstrates, this model overlays almost perfectly on the environment of tactical combat.

However, before examining the environment of combat, two additional problem-solving concepts must be introduced. The first is the concept of 'bounded rationality'. In simple terms,

bounded rationality means that the amount of information available to the problem-solver always limits ('binds') the solutions to a given problem. Additionally, problem-solvers 'bind' situations with their individual perceptions of a situation, as well as their definitions of 'good,' 'bad,' and 'better' possible outcomes.[25]

This concept highlights the importance of group analysis. As Reitzel points out, bounded rationality dictates that no single problem-solver, regardless of levels of training or experience, is able to make consistently good decisions, as "situations soon become too complex for individual handling."[26] Detailed analysis lowers the uncertainty of a situation; group problem-solving increases the capacity of a unit to handle complexity. Therefore, better decisions – in complex situations – are the result of detailed, group analysis.

Reitzel also points out that problem 'types' are not unrelated," and suggests that problems encountered by military units may actually represent *decision-sets*.[27] Reitzel notes that most problems include numerous sub-problems, or decision-sets, which can only be addressed once the over-arching problem-solution is decided upon. In the context of tactical operations, this concept implies that decisions made once an operation is underway, link directly to the course of action originally selected. Situations involving decision-sets are "of frequent occurrence in military experience."[28]

Combined with the concept of 'bounded rationality' (better analysis = better decisions), the concept of decision-sets implies that analysis conducted before a tactical mission has a direct effect on decisions made after a mission begins. 'Bounded rationality' drives the need for analysis, and decision-sets demonstrate the link between analysis and future decisions. Together, these concepts are critical to the justification for using an analytical decision-making model during tactical planning.

To summarize this section, problem 'types' drive selection of decision-making models. From this, it is apparent that analytical models, like the MDMP, work best in situations fitting the description of *set-piece*, *difficulty* problems, with *unstructured* levels of information.

Furthermore, the concepts of 'bounded rationality,' and decision-sets emphasize the importance of conducting analysis when making decisions. The following section shows how and when the environment of tactical combat creates the conditions that allow this analysis to take place.

The Tactical Decision-Making Environment

As noted at the beginning of this chapter, a systemic analysis of tactical C2 must account for the overall situation. Tactical C2 takes place in the environment of tactical combat. Current Army doctrine describes the tactical level of war as the use of "battles and engagements…to accomplish…objectives assigned to tactical units," and tactics as "battlefield problem-solving – usually rapid and dynamic in nature."[29] In simple terms, at the tactical level of war brigades and battalions use lethal force to close with and engage an enemy who is trying to do the same to them.

Analyzing decision-making at this level of war requires a consideration of its temporal, physical, and cognitive dimensions. These dimensions parallel the distinguishing characteristics of problems – time, solvability, and information – identified by problem-solving theory. Understanding this linkage enables comprehension of how the tactical decision-making environment demonstrates different problem types, and prescribes the use of analytical or intuitive decision-making models. Figure 5 demonstrates these links.
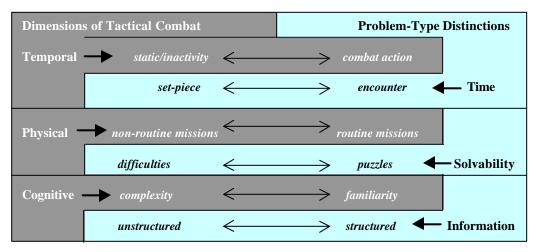

Figure 5 – The Types of Problems in Each Dimension of Tactical Combat

The temporal dimension of combat illustrates the existence of *set-piece* and *encounter* problems. As Clausewitz noted, the temporal dimension of combat at the tactical level involves "periods of active warfare…interspersed with greater or smaller periods of rest."[30] Major General Robert Shoemaker, commander of the 1st Cavalry Division during the Vietnam War, echoed this idea by noting that combat "tends to be [of a] very short duration and [is] conducted in spurts separated by much longer periods of relative static combat, or even inactivity."[31] This variance in time implies the existence of both *set-piece* and *encounter* problems.

The temporal dimension of tactics also encompasses the concept of timely decisions. Numerous military experts suggest that, "war is a race to gain a time advantage over the enemy."[32] However, success at the tactical level also depends on coordinated action at a decisive time and place, and coordination implies spending time to synchronize unit effort. Therefore, the concept of timely decisions also suggests *set-piece/encounter* problem distinctions. Units actively engaging the enemy on a combat mission, face *encounter* problems; units synchronizing action face *set-piece* problems. A similar separation of problem-types also occurs in the physical dimension.

The physical dimension of the tactical environment accounts for the effects of terrain, and lethal force on combat units. Factors such as the weather, smoke, sustained enemy fires, and the threat of injury or death cause brigades and battalions in combat to face confusion, danger, risk, exertion and uncertainty as a matter of course. Regardless of the situation's difficulty, tactical units perform military missions in order to fulfill the intent of the next higher commander. Some of these tasks are routine (ones the unit trained for) and others are not. Considered in the context of problem-solving theory, the physical aspect of the tactical environment demonstrates the existence of *puzzle* and *difficulty*-type problems. Routine missions represent problems solvable by simple, familiar solutions; non-routine missions require units to develop and analyze options. Comparison of the cognitive dimension elicits similar results.

The cognitive dimension of the tactical environment reflects the collection, transmission, analysis, and use of information to solve tactical problems. This includes the structure, fields of expertise, and experience of tactical-level staffs, and the technical means used to transmit information. It also includes the varying amounts of available information about the enemy, the terrain, and the friendly force.

From this cognitive perspective, combat at the tactical level is "characterized by increased confusion, conflicting information…and an overall sense of immediacy and increased pressure."[33] In other words, the amount of information necessary for decisions varies. Clausewitz described this as "friction," and contributed it to the "countless minor incidents [that] combine to lower the general level of performance."[34] This parallels the description of *unstructured* and *structured* problem types. *Unstructured* problems require greater amounts information to make sense of the situation and determine goals; *structured* problems require less information. Clearly, the cognitive dimension demonstrates the possibility of both of these problem-types to exist at the tactical level.

Considered comprehensively, the temporal, physical, and cognitive domains of the tactical level make up an environment that gives rise to many different problem-types. Because of this variety of problem types, both analytical and intuitive decision-making models have distinct roles in the tactical environment. Understanding this adds deeper meaning to the definitions of tactical planning and combat-action decision-making put forth in chapter one.

Tactical planning and combat-action decision-making are separate problem-solving processes, designed to solve different types of problems, based on different situations within the tactical environment. Tactical planning reflects the analysis – deemed necessary by the concepts of bounded rationality and decision sets – units conduct in times of static combat or inactivity. Combat-action decision-making is the intuitive process conducted by commanders after initiating contact with opponents. "Intuitive decision-making has its strength…once hostilities have started and not necessarily in battle preparation where a more analytical approach might be…more

appropriate."[35]   Understanding how tactical planning and combat-action decision-making

interrelate requires a deeper conceptualization of the over-arching command and control (C2)

process.

The Tactical C2 Model

The larger, holistic context of command and control reveals that tactical planning and

combat-action decision-making are sub-elements of an over-arching C2 process. Stated another

way, C2 in the tactical environment represents a system. Given the nature of systems, therefore,

an analysis of each sub-element of the tactical C2 system, without consideration of the greater

whole, is insufficient.[36]

As mentioned above, the tactical C2 system encompasses several sub-elements. These sub-

elements include: the commander, the staff, tactical planning, combat-action decision-making,

and the MDMP.[37] As a system, these sub-elements combine to provide the cybernetic means to

solve problems – by making and enabling decisions – within the tactical environment.

The driving force behind this system is the commander. The commander applies battle

command to "visualize the operation, describe it in terms of intent and guidance, and direct the

actions of subordinates."[38] Commanders provide purposive motivational force by making

decisions. These decisions resolve both the initial problems – such as course of action selection,

and new problems that arise during the interaction of forces in combat.

Assisting the commander in these tasks is the tactical staff, which performs three key

functions. First, and foremost, they provide necessary information and analysis to assist the

commander in visualizing and selecting a course of action. Second, they synchronize and

coordinate the commander's description of intended action, by refining the plan. This refinement

involves solving minor problems – making decisions within the framework established by the

commander's selected course of action. Third, they provide additional information to assist the

commander in directing the actions of subordinates during the fight.

Examining the interaction of the commander and staff systemically, the visualizing, describing, and directing actions of the staff and commander give rise to the next two sub-elements. Their combined efforts to visualize and describe encompass the process of tactical planning. Their directing actions are the process of combat-action decision-making.

Tactical planning is a dual-purposed, analytical process. First, it accomplishes the purpose of developing the situational understanding necessary for a commander to make an informed decision - visualization. Second, tactical planning continues as the plan is fully developed, synchronized, and communicated to subordinates - description. Most significantly, tactical planning results in a solution to the main *difficulty*-problem facing the unit. This solution becomes the selected course of action.

Commanders direct action by performing combat-action decision-making after a selected course of action is underway. Relying on judgment and experience, commanders employ intuitive decision-making skills to make rapid and timely decisions. Occasional assistance from the staff enhances the ability of commanders to direct.

The final sub-element is the MDMP. Within the construct of the tactical C2 system, the MDMP is the tool, employed by the commander and staff to accomplish tactical planning. Figure 6, below, represents a graphic visualization of the entire system.

Figure 6 also demonstrates the concept of linked decisions, or 'decision-sets.' As outlined above, the first stage of tactical planning results in the selection of a course of action, which establishes a framework for subsequent decisions. In order to maintain cohesiveness and synchronization of effort, all subsequent decisions must reflect this framework. In this way, "planning is integrated decision-making."[39]

For example, as the selected course of action is refined into a final plan, and as that plan is put into action against the enemy, additional future problems occur. In some cases, these problems are small, coordinating actions such as matching tasks to subordinate units. In other cases, these problems are major re-directions of action such as the execution of a contingency

plan. In either case, the originally selected course of action limits, or frames the options available for solving these problems.
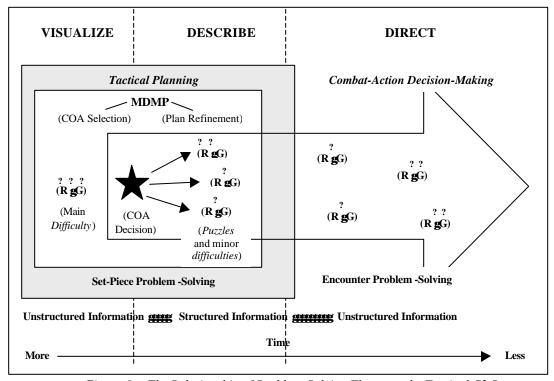

Figure 6 – The Relationship of Problem-Solving Theory to the Tactical C2 System

The systemic interrelationships described in figure 6 also reveals the way in which the tactical C2 system aligns with problem-solving theory and the tactical environment. This alignment justifies the use of the MDMP for tactical planning. As an analytical model, the MDMP facilitates the analysis needed over overcome *unstructured* information levels and the comparison and deliberation required of *difficulties*. Furthermore, commanders/staffs employ it within the temporal context at a point where time *is* relatively available.

Summary

Within the context of the tactical C2 system, and when analyzed in accordance with problem-solving theory and the temporal/physical/cognitive aspects of the tactical environment, the MDMP is a valid and justified component of tactical problem solving. As figures 3 and 4 outlined, analytical models are the better fit for problems when time is permitting, problems can

only be surmounted, information levels are low, and groups are available to accomplish problem-solving.

This justification of the MDMP also enables a better understanding of the apparent dichotomy in keystone doctrine examined in Chapter 2. Keystone doctrine – historical and current – emphasizes analysis and intuition because both have equal places in the over-arching tactical C2 system. Furthermore, because decisions made through analysis during tactical planning are linked to the intuitive decisions of combat-action, there is no need for a separate process. As Klein notes, intuitive decisions are nearly automatic.[40]

Finally, understanding this model of the tactical C2 system enables a more precise analysis into the use of the MDMP. Much criticism directed against the MDMP focuses on the use of analytical models in a tactical environment. However, as the tactical C2 model evidences, analysis *is* needed during tactical planning to support combat-action decision-making. The remainder of this paper focuses on whether the current MDMP is the *right* analytical process.

---

[1] Peter M. Senge, *The Fifth Discipline*, (New York: Currency Doubleday), 1994, 66.

[2] Problem-solving theory refers to a vast body of knowledge and research – it is not the product of a single individual. The history of problem-solving theory stretches back as far as the ancient Greek philosophers. However, most modern theories – the ones based on cognitive psychology – originally stem from the work of John Dewey and, more recently, Herbert Simon. The impact of John Dewey on problem solving theory is noted in several current texts. For examples see: David Kolb, "Problem Management: Learning From Experience," in *The Executive Mind*, ed. Suresh Srivastva, (San Francisco: Jossey-Bass Publishers), 1983 and Herbert A. Simon, *Administrative Behavior*, 3d edition, (New York: The Free Press), 1976. Dr. Simon's research is particularly relevant to military decision-making processes, due to the extensive work on decision behavior that he has done for the Departments of Defense and the Navy.

[3] Herbert A. Simon, *Administrative Behavior*, 3d edition, (New York: The Free Press), 1976, 1.

[4] Herbert A. Simon, "Background of Decision Making," *Naval War College Review*, (Annapolis: U.S. Naval War College), 1957, 3.

[5] Although these three scientists represent only a very small portion of the total amount of study done on problem-solving, the collective emphasis on the application of their theories to military operations justify their inclusion in this research. Both Simon and Reitzel worked extensively with the Department of the Navy, lecturing at the Naval War College, and providing independent research. See: Herbert A. Simon, "Background of Decision Making," *Naval War College Review*, (Annapolis: U.S. Naval War College), 1957, 3; and Reitzel, "Background to Decision Making," – referenced above, and in Chapter 1.) Although Kolb did not work exclusively for the U.S. Military – his primary emphasis is on Learning Theory – he is recognized as an 'expert' on the field of expertise. Specifically, his research (relatively unique in the cognitive psychology field) centers on the applicability of experience to the problem-solving process. His description for the separation of problem types according to the 'structure' of information was not found by this author in any other source. (See reference to Kolb's work included in note 2, above, and also: Donna Smith and David Kolb, *User's Guide for the Learning Style Inventory*, (Boston: McBer and Company), 1986.)

[6] Herbert A. Simon, "Background of Decision Making," *Naval War College Review*, (Annapolis : U.S. Naval War College), 1957, 3.

[7] Ibid.

[8] Ibid, 8.

[9] Reitzel, "Background to Decision Making," 39.

[10] Ibid, 40-41. Reitzel also makes a distinction between learning and problem-solving. If a given situation constantly reoccurs, and is easily solved by a logical action, then the process taking place is characterized as *learning*, not problem solving. For example:

> "This…is what every underfed white rat is faced with every time a psychologist
> puts him in front of two doors, a black one and a white one, with food behind one
> door and no food behind the other. Given the real incentive – food; and a motivation
> to do something about it – hunger; a rat quickly learns by trial and error…Except for
> a short period of experimentation…the process is one of learning." (p.2)

This distinction is necessary because it establishes the basis for understanding problem-solving theory. Problem-solving is concerned with actions taken in response to "disruptions in the *learned* relationship" between humans and their environment.[10] The fact that some problem situations become matters of learned routine, suggests that there are different categories of problems, which in turn suggests that there are probably different problem-solving methods which are better suited for particular problem types.

[11] Ibid.

[12] Kolb, "Problem Management…," 121. Refers to entire paragraph.

[13] Ibid.

[14] Ibid.

[15] In June of 1996, the U.S. Army Research Institute for Behavioral and Social Sciences had catalogued 66 different decision-making related research projects that had been conducted under U.S. Army sponsorship. (Halpin, *The Human Dimensions of Battle Command,* 18.)

[16] This categorization is derived from a variety of sources, although not all specifically denote this particular designation. For example, Klein [Gary A. Klein, "Strategies of Decision-Making," *Military Review*, (Fort Leavenworth: U.S. Army Combined Arms Center), May 1989] makes the distinction between "analytical" and "recognitional-intuitive" processes, but stresses in his endnotes that "analytic" is a broad generalization of processes. Lee Roy Beach and Terence Mitchell ("A Contingency Model for the Selection of Strategies," *Academy of Management Review*, vol.3, 1978, 439-449) identify three broad strategies: Aided-analytic, Unaided-analytic and Non-analytic. Payne, Bettman, and Johnson (John Payne, James Bettman, and Eric Johnson, "Behavioral Decision Research: A Constructive Processing Perspective," *Annual Review of Psychology*, vol.43, 1992, 89.) refer to research done in comparing "analytical" and "intuitive" processes.

[17] Lee Roy Beach and Terrence R. Mitchell, "A Contingency Model for the Selection of Decision Strategies," *Academy of Management Review*, vol.3, 1978, 441.

[18] W.C. Howell, "Engineering Psychology in a Changing World," *Annual Review of Psychology*, vol. 44, 1993, 255.

[19] Klein, *Making Decisions in Natural Environments*, 2.

[20] Ibid, 17. For a fuller explanation of the RPD model, see Figure 6 (Chapter 5 of this paper) and also: Gary Klein, *Sources of Power: How People Make Decisions*, (Cambridge, MA: The MIT Press), 1999, 25-30.

[21] Klein, *Sources of Power*, 20. 'Satisficing' is defined by Klein as "selecting the first option that works (*Sources of Power,* 20); the term was first coined by Herbert Simon. Klein contrasts 'satisficing' with 'optimizing;' "…optimizing is hard and takes a long time. Satisficing is more efficient." (Ibid).

For a fuller explanation of the RPD model, see Figure 6 (Chapter 5 of this paper) and also: Gary Klein, *Sources of Power: How People Make Decisions*, (Cambridge, MA: The MIT Press), 1999, 25-30.

[22] Charles C. Krulak, "Cultivating Intuitive Decisionmaking," *Marine Corps Gazette*, vol. 83, no. 5, May 1999, 20. Research by Klein and others also reveals that decision-makers utilizing analytical models often shift to RPD usage in situations that demand immediate action. "Under more severe time pressure, people accelerated processing, focused on a subset of information, and changed processing strategies." (Payne et al, "Behavioral Decision Research," 99.)

[23] Klein, Strategies of Decision-Making," *Military Review*, (Fort Leavenworth: U.S. Army Combined Arms Center), May 1989, 58.

[24] Ibid. This figure was created using information from this article (primarily pages 60-61), and is loosely based on figure two of the article (page 61).

[25] Simon, *Administrative Behavior*, 38-40.

[26] Reitzel, 14.

[27] Ibid, 37.

[28] Ibid.

[29] U.S. Army. *Field Manual 100-5, Operations.* (Washington, D.C.: Headquarters, Department of the Army), 1993, 6-3.

[30] Carl Von Clausewitz, *On War*, ed. and trans by Michael Howard and Peter Paret, (Princeton: Princeton University Press), 1984, 221.

[31] Major General Robert M. Shoemaker, quoted in: (Maj) N.K. Chung, Jr., "An Analysis of Command and Control Doctrine for the Infantry Battalion During the Attack," MMAS Thesis (Fort Leavenworth: U.S. Army Command and General Staff College), 1975, 31.

[32] John Antal, Major, U.S. Army, "An Analysis of the Tactical Orders Process," MMAS Thesis, (Fort Leavenworth: U.S. Army Command and General Staff College), 1990, 2. Similar concepts and/or statements can be attributed to several military authors, including General George Patton.

[33] Marvin Thordsen, Joseph Glushka, Gary Klein, Saul Young, and Christopher Brezovic. "A Knowledge Elicitation Study of Military Planning," *Technical Report 879*, (Alexandria: U.S. Army Research Institute for Behavioral and Social Sciences), AD-AD19 969, 1990, 2. Hereafter referred to as Thordson, et al.

[34] Clausewitz, 119.

[35] Rogers, "Intuition: An Imperative of Command," 46.

[36] Senge, *The Fifth Discipline*, 66.

[37] A more complete listing of tactical C2 elements includes the electronic and other media employed to transmit and receive information. However, in order to maintain an isolation of focus on the MDMP, this sub-element is not addressed.

[38] *FM 3-0*, 5-1.

[39] Henry Mintzberg,. *The Rise and Fall of Strategic Planning*, (New York: The Free Press), 1994, 11.

[40] Gary Klein, *Making Decisions in Natural Environments*, (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), 1997, 7.

CHAPTER 4

The MDMP and Keystone Doctrine

We consider it axiomatic that in war there will always be a plan. But history is replete with instances where organizations have drifted into battle for no particular reason and with no particular plan.

Infantry in Battle, 1939

The first chapter introduced criteria sets for evaluating the MDMP – one based on keystone doctrine and the other based on the psychological needs of the commander.   Underlying both of these questions is the assumption that an analytical process is applicable. The previous chapter established the justification of an analytical process as the proper tool for tactical planning in the larger tactical C2 context. Continued analysis examines whether the current MDMP is the *right* analytical process. Evaluation against the first criteria set is the object of this chapter.

Current Army keystone doctrine implies four fundamental imperatives regarding tactical planning – flexibility, timeliness, effectiveness, and detailed analysis. Previous editions of FM 100-5 emphasized these four items as well. Given their importance in current and historical keystone doctrine, this research employs these concepts as criteria to validate the use of the current MDMP in tactical planning. Since no version of U.S. Army keystone doctrine states these imperatives overtly (such as, 'the fundamentals of planning are…'), the first section of this chapter will demonstrate their existence and importance.

Although there are some areas in which the current *FM 101-5* might be improved to better emphasize these themes, for the most part the MDMP does what keystone doctrine says it should. The second section of this chapter evaluates the MDMP against these criteria, showing how the current process does and does not reflect the imperatives outlined in keystone doctrine. Ultimately, analysis of the current MDMP suggests that it is in congruence with these four doctrinal criteria.

Doctrinally Based Criteria

This section examines in detail the four fundamental imperatives of tactical planning
identified in current keystone doctrine – flexibility, timeliness, effectiveness, and detailed
analysis. This examination provides the justification for each concept as a relevant evaluation
criterion, and denotes specific means of measuring the MDMP. This analysis includes three
important elements.

The first element is a definition of each criterion for the purposes of this research. The
second element is an examination of how keystone doctrine establishes the importance of each
theme.[1] Thirdly, specific methods of measuring the MDMP against each criterion are established.

Flexibility

The first of the doctrinally based criteria is flexibility. Flexibility in tactical planning means
that the planning effort is prepared to account for the friction of combat. Both the *FM 3-0* and
FM 100-5 (1993) allude to this need for flexibility by paraphrasing the Prussian Field Marshal
Helmuth von Moltke's famous dictum that "no plan survives contact with the enemy."[2]

Current keystone doctrine establishes flexibility as a planning imperative.[3] FM 3-0 states that
"commanders ensure that plans remain as flexible as possible…" and notes that effective plans
place "a premium on flexibility."[4] *FM 100-5* (1993) dictates that planning "should be…flexible
enough to accommodate change…" and points out that the "commander builds flexibility into his
plan [in order to] preserve freedom of action under…changing conditions."[5] Both manuals make
clear an emphasis on the need for flexibility in planning through sheer volume of times the
subject is mentioned.[6]

According to keystone doctrine, tactical planning should achieve flexibility in several ways.
First, planning should be *situationally adaptive*. This means that tactical plans and tactical
planning should not only anticipate events, but also allow for the ability of "commander[s] to
adjust plans."[7] As *FM 3-0* notes, "adaptive planning characterizes successful operations."[8]

In addition to being adaptive, planning demonstrates flexibility by *creating options* for commanders. Keystone doctrine states unequivocally that "tactical planning emphasizes flexibility and options."[9] Additionally, it dictates that tactical units should always "seek to increase their options" because "a diversity of available options…gives U.S. commanders the means to…defeat armed adversaries."[10] The ability of a planning process to *create options* is also important because it gives rise to a third means of reinforcing flexibility in planning – options foster *initiative*.

A third way planning demonstrates flexibility is by "providing subordinate commanders the latitude and guidance to exercise disciplined *initiative*."[11] The Army's keystone doctrine makes this clear when it says, "commanders reinforce [the] expectation to seize the initiative" through flexible "plans and directions to subordinates."[12] Since maintaining the *initiative* is imperative to conducting successful operations, it is critical that tactical planning reflects this flexibility.

All three of these methods of achieving flexibility in tactical planning – *adaptability*, *options*, and *initiative* – imply knowledge of the *need* for change; however, this is not something that happens automatically. Therefore, flexibility in tactical planning also requires *feedback*. This is the final method by which tactical planning demonstrates flexibility. In order to maintain flexibility, planning must account for the means of recognizing a need or an opportunity for change.

These specific methods for achieving flexibility – being *situationally adaptive*, *creating options, fostering initiative*, and *providing feedback* – form the standards of measurement for determining whether the MDMP is flexible. In other words, the MDMP is flexible if it incorporates these keystone doctrine-specific methods.

<div align="center">***Timeliness***</div>

The second of the doctrinally based criteria is timeliness. Timeliness in tactical planning means knowing if, when, and what to decide, in a manner faster than the opponent.[13] Although brevity and speed are essential[14], timeliness in tactical planning means more than doing things

quickly. It implies a mastery of situational understanding that allows units to establish a superior tactical tempo, or "rate of action."[15] Inherent in the concept of timeliness is an understanding by planners of whether the situation allows time for tactical planning, or requires combat-action decision-making. "Proper use of the time available can fundamentally alter the situation."[16]

Keystone doctrine states explicitly that timeliness is a major component of both effective battle command and effective decision-making.[17] Both *FM 3-0* and *FM 100-5* (1993) acknowledge that the concept of timeliness in planning implies something more than mere quickness of action. Further, both manuals convey that timeliness is critical in gaining and maintaining the initiative in battle.[18]

FM 3-0 describes timeliness as maximizing the use of time in order to achieve a relative time advantage over the enemy. This control of time "is a necessary means of retaining the initiative." Effective tactical planning facilitates allows units to "exceed the ability of the enemy to react" giving them a "marked advantage."[19]

Likewise, *FM 100-5* (1993) denotes that "successful planning requires an appreciation of the simultaneous nature of operations [and] an anticipation of future events" which enables "planning done as thoroughly as time allows."[20] This appreciation of time and anticipation of future events facilitates "retaining the initiative over time."[21]

Keystone doctrine sets forth three ways in which tactical planning achieves the benefits of timeliness. The first way is by emphasizing *simplicity*; "simplicity in planning will help ensure success."[22] Simplicity in planning means focusing on only the essential tasks, avoiding complex or confusing schemes of maneuver, and using brevity and clarity in the communication of orders. *FM 3-0* emphasizes that units achieve simplicity by "preparing clear, uncomplicated plans."[23]

The second way in which tactical planning maximizes timeliness is through the application of *near-simultaneous planning* efforts. The hierarchical structure of a military organization drives a process in which higher headquarters pass plans and orders to lower headquarters. To counteract

this serial nature, keystone doctrine urges the use of processes that "facilitate the action of subordinate units through parallel planning."[24]

The final way in which planners achieve timeliness is through *time comprehension* – knowing when to decide. Knowing when to decide implies that units identify and articulate potential decisions, and the establishment of mechanisms for gathering information relevant to these decisions.[25] Of the three methods for obtaining timeliness in planning urged by keystone doctrine, this is the most difficult to achieve.

These methods for achieving timeliness– *simplicity*, *near-simultaneous planning, and time comprehension* – are standards for measuring the MDMP. The MDMP demonstrates timeliness if it incorporates these keystone doctrine-specific methods.

<div align="center">

Effectiveness

</div>

The third criterion for tactical planning incorporated in keystone doctrine is effectiveness. Effective tactical planning places successful mission accomplishment over all other considerations. This means that tactical planners do not blindly adhere to doctrinally mandated force ratios, suggested task organizations, and/or other processes or formulae that might jeopardize mission accomplishment. Effective planning is a "framework from which to adapt, not a script to be followed to the letter." [26]

Keystone doctrine clearly states the importance of this concept.[27] FM 3-0 asserts that tactical planning that "facilitates effective action" is the truest "measure of a good plan."[28] Further, keystone doctrine directly establishes the importance of planning effectiveness by explaining that all planning processes should be "means to an end…their value lies in the result, not the process."[29] Additionally, emphasis on effectiveness is also inherent in the keystone doctrinal concept of decisive points. Both FM 3-0 and the 1993 version of FM 100-5 urge planners to identify "from all possible decisive points" the ones that provide the most potential for effective employment of forces.[30] In short, current doctrine places a higher value on effectiveness than form.

Ensuring synchronization and allowing for *flexible modification* in technique are the two ways, short of successful mission accomplishment, that tactical planning demonstrates effectiveness. As keystone doctrine-specified methods, they are also standards for measuring the MDMP. In other words, the MDMP demonstrates effectiveness if it enhances *synchronization* and allows for *flexible modification* of process.

<p style="text-align:center">***Focused Analysis***</p>

The final criterion established by keystone doctrine is focused analysis. Focused analysis in tactical planning refers to the combined effort to examine as much information relevant to the mission as time allows. Keystone doctrine refers to focused analyzing as "framing the battlespace" and emphasizes that "commanders…must clearly understand the situation in the battlespace."[31]

By its very definition, analysis – the determination and description of the nature of something – is inherent in planning. In order to plan anything, units must attempt at determining or describing the nature of the situation. Focused analysis, therefore, refers to something more – detailed analysis, centered on mission accomplishment.

Current keystone doctrine illustrates the importance of focused analysis in tactical planning in several ways.[32] First, it equates focused analysis with success: "comprehensive…planning characterizes successful operations."[33] Furthermore, it specifies, "commanders [must] consider everything that affects their operation."[34]

Keystone doctrine also designates focused analysis as the role of the staff. Staff members employ analysis to supplement the judgment and experience of commanders. Through this interface of the commander and staff, focused analysis enables effective battle command because it "sets the conditions" for visualization.[35]

As noted above, some level of analysis is inherent in all planning. Therefore, proper evaluation of a tactical planning process like the MDMP requires more incisive methods of

measurement. A deeper analysis of keystone doctrine reveals two characteristics that distinguish analysis as focused.

The first characteristic of focused analysis is that it *concentrates* on the needs of the commander. "Commanders direct staffs to provide the information necessary to shape their vision." This information takes the shape of "focused analysis on the situation and potential effects of operations," and supports the commander's decision-making.[36] If staffs do not focus information in this way, they can quickly overload commanders with relevant data.

The second characteristic of focused analysis is that it is *detailed.* "The staff assists the commander with the coordination and detailed analysis necessary."[37] This complements the first characteristic, and implies the same requirement to filter data for relevancy.

These characteristics of focused analysis– *concentrated on the commander's needs*, and *detailed* – are the standards for measuring the MDMP. The MDMP demonstrates focused analysis if it incorporates these keystone doctrine-specific methods.

To summarize this section, it is clear that current keystone doctrine emphasizes four concepts as critical to tactical planning. In order to be effective, a tactical planning process must demonstrate flexibility, timeliness, effectiveness, and purposive analysis. Furthermore, these concepts are battle-proven and have stood the test of time. Historical versions of keystone doctrine confirm this.

Analysis of the MDMP

To review, the overarching purpose of this research is to determine whether usage of the MDMP during tactical planning enhances combat-action decision-making. The previous chapter illustrated the differentiation between tactical planning and combat-action decision-making, and justified the use of an analytical process for the former. This enables current analysis to focus on usage of the MDMP to support planning prior to contact with the enemy – the realm of tactical planning. In support of the research question, the specific goal of this chapter is to establish whether the MDMP fits the doctrinally mandated description of tactical planning.

Analysis of the MDMP reveals that the process complies with the fundamental planning imperatives established in keystone doctrine – flexibility, timeliness, effectiveness, and focused analysis. Using these concepts as criteria, the MDMP generally reflects congruence with keystone doctrine; exceptions to this are noted at the end of the chapter.

Flexibility. Using the MDMP for tactical planning enhances flexibility. In fact, the current MDMP establishes determination of "most flexible courses of action" as a primary evaluative goal during planning.[38] Further, the MDMP positively incorporates all four of the methods outlined by keystone doctrine to achieve flexibility. The MDMP builds situational adaptability, provides options, fosters initiative, and establishes feedback mechanisms.

The MDMP demonstrates situational adaptability most clearly during the 'course of action (COA) analysis' step. First, it dictates the development of branches and sequels – planned modifications or subsequent missions – to courses of action (COAs). This allows commanders to prepare for change, and adapt to potential situations as necessary. Second, the MDMP requires the examination of decision points and the development of decision-support products. By overtly analyzing potential points of decision in COAs, units are able to think through the time-space, and force requirements for recognizing the need for change. By including the development of branches and sequels and the analysis of decision points, the MDMP incorporates situational adaptability.[39]

The MDMP also demonstrates flexibility by providing commander's options; the stated design of the process is a thorough examination of "numerous friendly…courses of action." Two specific examples of how the MDMP provides options are evident in the 'COA development' and 'COA analysis' steps. First, during COA development, the MDMP urges planners to employ "brainstorming" to "provide the widest range of options."[40] Likewise, during COA analysis, the intent of wargaming is to "provide insights that might not otherwise be discovered."[41] Furthermore, even though only one COA is eventually selected, by following the MDMP

technique of developing and analyzing multiple COAs allows commanders to mentally evaluate other options; options they could employ if the battlefield situation changes.

Fostering initiative is a third way the MDMP demonstrates flexibility. The MDMP accomplishes this through emphasis on commander's intent. Commander's intent is "the link between mission and concept of operations [that provides] the basis for subordinates to exercise initiative."[42] The current MDMP highlights the importance of this planning element by dedicating an entire page to its development and usage.

A second way the MDMP fosters initiative is through proper order writing. *FM 101-5* (1997) specifies that orders, "provide the *what* rather than the *how*," and includes "decentralized execution" as a criteria for a well-written plan.[43] Communication of orders to subordinates in this manner enables them to exercise initiative, and prevents micromanagement.

The final way the MDMP demonstrates flexibility is through establishing methods of feedback. As noted above, during the 'COA analysis' step, planners think through the requirements for recognizing the need for change. Establishing specific missions or units to report this information provides the necessary feedback. Furthermore, the MDMP ensures feedback by directing the development of information requirements tied to commanders' decisions; generally known as the Commander's Critical Information Requirements (CCIR).[44]

Timeliness. In addition to enhancing flexibility, the MDMP also enhances timeliness in tactical planning. Proof of this is evident in that the MDMP positively addresses the three methods outlined by keystone doctrine to achieve timeliness. The MDMP emphasizes simplicity, near-simultaneous planning, and inculcates time comprehension in tactical planning.

The MDMP provides three specific examples of its emphasis on simplicity. First and foremost is the fact that the MDMP provides a standardized format, common to all U.S. Army units. Standardized formats facilitate rapid comprehension and utilization by reducing confusion and minimizing misinterpretation. Second, the MDMP encourages the use of sketches, where

possible, to convey information in a useable, visual form, in order to enhance understanding. [45]

Last, the MDMP designs its final product – operations orders – as "clear and concise [expressions of the] concept of operation."[46] Standard formats, pictorial visualizations, and clarity in final products demonstrate the MDMP's emphasis on simplicity.

Near-simultaneity in tactical planning is another hallmark of the MDMP. The three ways the MDMP illustrates this are through its emphasis on parallel planning, warning orders, and the use of liaison officers. The MDMP establishes "parallel planning [as] a routine procedure."[47] This is especially evident in the procedure's treatment of the Intelligence Preparation of the Battlefield (IPB) process, which is embedded in the 'Mission Analysis' step; units are encouraged to "provide all intelligence products to subordinate units as soon as they are available." The MDMP specifies two mandatory, and two optional warning orders to "facilitate parallel planning" as well. [48] Finally, the MDMP recommends use of liaison officers to provide immediate clarification as subordinate staffs execute concurrent planning.[49]

The last way the MDMP exhibits timeliness in tactical planning is through its emphasis on time comprehension. *FM 101-5* echoes keystone doctrine on this point exactly when it states in the first line of the MDMP chapter that "decision making is knowing *if*, then *when*, and *what* to decide."[50] The emphasis on comprehending time is clear throughout the MDMP. First, every step in the process includes specific mention for planners to analyze time available, because "time…determines [the level of] detail with which the staff can plan."[51] Second, the MDMP directs specific analysis of key decisions, such as the ones included on the decision-support template, for timing implications. This provides planners with a refined understanding of when commanders must make decisions.

Effectiveness.   The third criterion established by keystone doctrine is effectiveness. Through its emphasis on the two methods suggested in keystone doctrine – synchronization and allowance for

modification – the MDMP demonstrates effectiveness in tactical planning. In fact, the MDMP

establishes effectiveness as the primary goal of staffs.[52]

The MDMP's emphasis on synchronization is most apparent during the "COA Development"

and "COA Analysis' steps. During COA Development, planners designate main and supporting

efforts, and establish the relationship between different units. This starts the synchronization

process. During COA Analysis, planners "identify synchronization requirements," and ensure

they are included in the plan.[53] One of the stated final products of a wargame is a synchronization

matrix. The MDMP is clear on the importance of synchronization. [54]

The MDMP also clearly illustrates the need for modification of the process – especially in

time-constrained environment. "An inflexible process, used in all situations, will not work."[55]

The ability and need for commanders to modify the process is established at the outset of the

MDMP. Step one, "Receive the mission" states that commanders must issue guidance on "how

to abbreviate the MDMP" before the second step even starts.[56]

Focused Analysis.   The final way in which the MDMP demonstrates its alignment with the

mandates of keystone doctrine is its emphasis on focused analysis. As stated in the previous

section focused analysis has two distinguishing features – it concentrates on the needs of the

commander and it is detailed. The MDMP highlights these two features.

Analysis concentrated on the commander's needs is built into the MDMP. The MDMP

stresses that tactical planning depends on a "clear articulation of the commander's battlefield

vision."[57] In order to incorporate this, the MDMP includes several deliberate interfaces between

the staff and commander. These interfaces include the commander's initial guidance, planning

guidance, as well as the opportunities included at each of the briefings built into the MDMP.

Furthermore, the MDMP dictates that all courses of action must be suitable – "comply with

commander's guidance" – as a deliberate crosscheck.[58]

Detail in analysis is also built into the MDMP – "the MDMP is a detailed…process."[59] Evidence of the MDMP's detail is inherent in the 'Mission Analysis' step, which includes no less than 17 different steps. A specific example of this detail is the IPB process, which provides a full evaluation of the environment, the threat, and the interaction of both with friendly forces. However, emphasis on detail is the primary reason the MDMP becomes a time-consuming process.

Shortcomings. As the analysis above shows, the doctrinal description of the MDMP emphasizes flexibility, timeliness, effectiveness, and purposive analysis in tactical planning. However, sometimes these characteristics are inhibited, which prevents effective the use of the MDMP in tactical planning. The causes of this inhibition are two-fold.

For the most part, this inhibition results from faulty execution of the MDMP. For example, lack of commander involvement, over-emphasis on process, and lack of clarity in orders are all ways in which units fail to properly employ the MDMP. Chapter 6 examines shortcomings in the execution of the MDMP in detail.

On the other hand, the MDMP's doctrine causes some inhibitions by itself. One example is the MDMP's lack of discussion on the development of simple plans. Although clearly outlined in keystone doctrine, there is no mention of it in FM 101-5.[60] Failure to develop simple plans could have a negative impact the timeliness of tactical planning. Chapter 6 also looks at doctrinally-based shortcomings.

Summary

The U.S. Army's keystone doctrine – current and historical – clearly illustrates expectations of effective tactical planning. As doctrine, these expectations are authoritative and include the battle-proven institutional knowledge and wisdom of generations of former officers and soldiers. Through its incorporation of flexibility, timeliness, effectiveness, and purposive analysis into tactical planning, the MDMP demonstrates that it does what keystone doctrine says it should.

However, the battalion and brigade commanders in the U.S. Army are not historical figures, they are human's making decisions. Therefore, to truly enhance combat action decision-making, the process used in tactical planning must also align with the cognitive demands of commanders. The following chapter addresses this subject.

---

[1] The fundamental planning imperatives are supported by both current and historical versions of *FM 100-5, Operations.* For the sake of brevity, evidence of historical keystone doctrine's justification is included as notes.

[2] *FM 3-0, Operations,* 6-3; *FM 100-5, Operations* (1993), 6-9

[3] Past editions of FM 100-5 illustrate the concept of flexibility as well. The 1941, 1944, and 1949 versions all warn that "obstacles, frictions, and mistakes are commonplace in battle" and therefore planners should regard the need for change as "commonplace." The 1954 version states that planning "procedures must be sufficiently flexible to meet the exigencies of unusual situations." The 1962 and 1968 versions note that "alternate plans" should be "developed for all foreseeable contingencies," while the 1976 version calls for a "flexible system of mission orders." In 1986 the concept is elevated to "the key for successful planning."

The emphasis and importance placed on flexibility in planning varies in the versions of *FM 100-5* before 1993. However, the manner in which it is included – as demonstrated above – clearly shows that keystone doctrine has always recognized a need for flexible plans. This lends credibility to its inclusion as an evaluation criterion. In short, the U.S. Army has long recognized the need for flexibility in planning. (*FM 100-5* (1941), 24; *FM 100-5* (1944) 35; *FM 100-5* (1949), 23; *FM 100-5* (1954), 224; *FM 100-5* (1962), 24; *FM 100-5* (1968), 3-4; *FM 100-5* (1976), 3-2; *FM 100-5* (1986), 33.)

[4] *FM 3-0*, 6-3 and 6-5.

[5] *FM 100-5* (1993), 6-9.

[6] The *FM 3-0* mentions flexibility directly, and indirectly no less than nine times (pages 4-14, 4-15, 6-0, 6-1, 6-2, 6-3, 6-4, 6-15, and 6-17.) The 1993 version of *FM 100-5* mentions flexibility no less than seven times directly (pages 2-2, 2-15, 6-0, 6-9 twice, 6-15 twice.)

[7] *FM 100-5 (1993),* 2-15.

[8] *FM 3-0*, 6-2.

[9] Ibid, 6-4.

[10] *FM 100-5* (1993), 2-2 and 6-0.

[11] *FM 3-0*, 6-2.

[12] Ibid, 6-3.

[13] Ibid, 5-2 and *FM 100-5* (1993), 2-14.

[14] *FM 3-0*, 6-4.

[15] Ibid, 5-12.

[16] Ibid, 5-5.

[17] Ibid, 5-2.

[18] The concept of timeliness appears in past editions of *FM 100-5* as well. The versions published in the 1940's cautioned that planning "often requires rapid thinking" because "to delay action…may result in lost opportunities." The 1954 version elevated "timeliness" to supreme importance by labeling it the "essence of command action." Versions from the 1960's and 1970's stressed the criticality of issuing timely orders. In 1986, *FM 100-5* emphasized detailed planning as the key to shortening "the friendly decision cycle" allowing commanders "to act faster than…opponent[s]." (*FM 100-5* (1941), 26; *FM 100-5* (1944), 36; *FM 100-5* (1949), 27; *FM 100-5* (1954), 31; *FM 100-5* (1962), 51; *FM 100-5* (1968), 5-5; *FM 100-5* (1976), 3-10).

[18] *FM 100-5* (1986), 30-31.

[19] Ibid, 5-12. This reference pertains to entire paragraph.

[20] *FM 100-5* (1993), 6-3.

[21] Ibid, p. 2-6.

[22] *FM 100-5* (1993), 3-4.

[23] *FM 3-0*, 4-14.

[24] Ibid, 6-5.

[25] Ibid, 6-2.

[26] Ibid, 6-1.

[27] This higher value on effectiveness is also apparent in historical keystone doctrine. For example, the 1941 and 1944 versions of FM 100-5 make this clear by warning against the blind application of "set rules or methods" which can limit effectiveness in planning. Similarly, in 1949 and 1954, keystone doctrine warned against the development of standard procedures that might "sacrifice effectiveness." However, the more recent editions of FM 100-5 address the need for effectiveness in tactical planning more directly. In 1976, effectiveness becomes "the objective of all Army units," and the 1986 version denotes that planning "above all else…must be effective," because "effective tactical planning is the best way to ensure synchronization." (*FM 100-5* (1941), ii; *FM 100-5* (1944), ii; *FM 100-5* (1949), 28; *FM 100-5* (1954), 32; *FM 100-5* (1976), 3-1; *FM 100-5* (1986), 29 and 35.)

[28] Ibid.

[29] Ibid, 6-5.

[30] Ibid, 5-7; *FM 100-5* (1993), 6-8.

[31] *FM 3-0*, 5-4.

[32] The emphasis on focused analysis in tactical planning also occurs in historical doctrine. The four versions of FM 100-5 published between 1941 until 1954 all highlighted the importance of analysis in their descriptions of the "estimate of the situation," described as the "process by which staffs evaluate the pertinent factors" of the mission. The versions of 1962 and 1968 stress that analysis should cover "all facets of the projected operation," and the 1986 version elevates analysis to the "essence of planning." Throughout the historical versions of keystone doctrine, emphasis on focused planning is clear. (*FM 100-5* (1941), 25; *FM 100-5* (1944), 35; *FM 100-5* (1949), 24; *FM 100-5* (1954), 31; *FM 100-5* (1962), 24; *FM 100-5* (1968), 3-4; *FM 100-5* (1986), 33.

[33] Ibid, 6-2

[34] *FM 100-5* (1993), 6-5.

[35] *FM 3-0*, 5-13. This reference applies to the entire paragraph.

[36] *FM 3-0*, 5-13.

[37] Ibid, 6-1.

[38] *FM 101-5* (1997), 5-16.

[39] Ibid, 5-16 to 5-24. Reference applies to entire paragraph.

[40] Ibid, 5-12

[41] Ibid, 5-16.

[42] Ibid, 5-9.

[43] Ibid, H-1 to H-4.

[44] Ibid, 5-7.

[45] Ibid, 5-26.

[46] Ibid.

[47] Ibid, 5-5.

[48] Ibid, 5-6.

[49] Ibid.

[50] Ibid, 5-1.

[51] Ibid, 5-5.

[52] Ibid, 5-2.

[53] Ibid, 5-16.

[54] Ibid, 5-27. The MDMP illustrates this by including the development of a "synchronized plan" in its description of the "focus of any planning process."

[55] Ibid, 5-27.

[56] Ibid, 5-2.

[57] Ibid, 5-1.

[58] Ibid, 5-11.

[59] Ibid, 5-1.

[60] *FM 3-0*, 4-14; *FM 100-5* (1993), 3-4.

CHAPTER 5

MDMP and the Needs of the Commander

The layman imagines vaguely that the job is well nigh done when…the commander decides by what general paths his men are to move against the enemy. Yet, this is the lesser portion of his responsibility.

S.L.A Marshall, *Men Against Fire*

The tactical C2 model introduced in chapter three justified the use of an analytical model in tactical planning to reinforce the intuitive decision-making of combat-action. Evidence in Chapter four, based on U.S. Army's keystone doctrine, suggests that the current MDMP *is* an adequate analytical decision-making model. However, this same doctrine also notes that during the fight, commanders must rely upon human factors such as "intuition and feel."[1] Therefore, this chapter examines use of the MDMP from the human dimension of decision-making.

The human dimension of decision-making refers to the cognitive, mental processes that occur inside the minds of decision-makers. These include concepts such as bias, judgment, and experience. Since decision-making is essentially "the foremost human…contribution involved in warfare," examination of these concepts is vital.[2]

Determining the value of an analytical process to intuitive decision-making requires an understanding of what the commander needs to make combat-action decisions. In short, analysis of intuitive decision-making models reveals potential limitations in the ability of all human decision-makers. To overcome these limitations, commanders need four things – *shared battlefield visualization*, a process for *monitoring*, a *conceptualization of time-space*, and *objective dialogue*.

These four needs form the criteria for measuring an analytical model's impact on intuitive decision-making. Evaluating the MDMP against them is the purpose of this chapter. Through

this comparison, the research in this chapter demonstrates that the MDMP does enhance combat-action decision-making.

The Commander's Needs

As previously explained, commanders make combat-action decisions using intuitive decision-making models. Gary Klein's RPD process is representative of intuitive models, in that it stresses the expertise of commanders in making decisions based on experience. In fact, according to Klein, in situations requiring rapid action, commanders use RPD over 90% of the time.[3]

In the RPD process, decision-makers "use their intuition to recognize the essence of a given situation and tell them what appropriate action to take."[4] First, they match situational "cues" or indicators to past experience in order to determine the need for change. Then, based on this same experience, they select a course of action. The process loops back on itself if decision-makers seek clarification of cues, or if mental simulation reveals a selected action as inappropriate. Figure 6 (below) depicts the RPD process.

Figure 6 – The Recognition-Primed Decision Model[5]

Successful application of the RPD model depends upon two key variables – *information* and *experience.* These support the two main actions decision-makers cognitively 'perform' – problem recognition and course of action selection. The first action – problem recognition – requires *information* to provide cues or patterns to the decision maker. This information could take the form of intelligence reports, situation updates, or actions the decision-maker observes directly. The second action – course of action selection – requires relevant experience. The decision-maker must have some frame of reference or knowledge-base that allows for the recognition of "patterns or similarities and to understand what those patterns typically mean."[6]

Deeper analysis of this dependency on information and experience reveals the potential flaws in intuitive decision-making models. Frankly, commanders using the RPD process could be basing decisions on less than perfect information, or they might not have the requisite experience. For example, an inaccurate report from a subordinate, or a thoughtful enemy employing a novel tactic might prompt the commander to perceive misleading cues (or perhaps none at all) causing him to order a premature deployment of his reserve. Although the commander wants to make a good decision, his own perceptions cause limitations.

Cognitive psychologists describe the limitation of a decision-maker's perceptions as 'bounded rationality,' a concept introduced in Chapter 3. To briefly summarize, the concept of bounded rationality suggests that although decision-makers want to make the best decision, the quality of information they receive, their perceptions of this information (and its source), and their ability to process information often prevents this from happening.[7]

In the context of tactical combat, bounded rationality coalesces into four different categories of things that limit commanders' decisions. These categories include: uncertainty, information inhibitors, expectations, and experience. A brief consideration of these categories provides an understanding what the commander specifically needs to make combat-action decisions.

Uncertainty limits the 'soundness' of decisions, by causing commanders to misjudge certain elements of a situation, such as time. Uncertainty refers to the commanders' perception of the

correctness or completeness of information, and usually results when information is not available or situations are unfamiliar. For example, if a unit's reconnaissance element fails to detect an approaching enemy, a commander may believe that he has more time to prepare or react than he really does. Uncertainty may also result if a commander is unsure about the "credibility" of an information source.[8]

Even if information is available, a commander's own mental characteristics might inhibit him from processing it properly, causing a failure to recognize the need or opportunity for change. These information inhibitors include a commander's personality and physiological stress. Research shows that a commander's personality determines how he prefers to receive information, and what information he thinks is important.[9] Additionally, numerous studies have confirmed that increased stress (caused by fear, lack of sleep, etc.) impairs the ability of commanders to make decisions.[10] Therefore, if a staff is not attuned to how and what a commander needs, or if the commander is under stress, they can fail to provide the necessary cues that allow a commander to intuitively recognize that a change is necessary.

A third category of limitations involves the commander's expectations, which can cause misidentification of cues or patterns. Commanders describe their expectations in terms of assigned missions and expressions of desired outcome. This description, in turn, frames the interpretation of information. For example, if a commander orders his unit to attack an enemy position, the assumption that the enemy will defend becomes an unspoken expectation. This assumption frames how the unit will seek and report information; the unit expects an enemy defense and reports all information accordingly. Therefore, even if the enemy attacks, the unit may continue to report information in the original context – reports of moving enemy vehicles are interpreted as 'roving patrols.' The tendency to misidentify information, based on the "framing effects" of expectations is well documented in psychological research.[11]

The final category of limitations affecting a commander is his level of expertise, which can create a strong reluctance to change. Research from several perspectives, including the

experience levels of commanders "demonstrates that expertise is not a panacea for making assessments of uncertain events."[12]   Cognitive psychologists offer three possible explanations for this. First, is the limited processing capability of the human mind; "an individual can only handle a finite number of variables before performance declines."[13] Second, is the suggestion that expertise comes in two varieties – routine and adaptive. This suggestion asserts that while an individual may perform well in familiar situations, they "have only modest capabilities in dealing with novel types of problems."[14]   The last possibility is that experienced decision-makers are subconsciously reluctant to change, and therefore adopt cognitive "defensive avoidance" measures that allow them to misinterpret a situation.[15] Psychologists classify this reluctance to change as "decision-conflict," and indicate that its primary cause is the commander's experienced-based perception.   In short, since the plan is his, he is committed to it, and that decreases the likelihood that he will change. Instead, he believes he has no options, or that change is too hard or too expensive. [16]
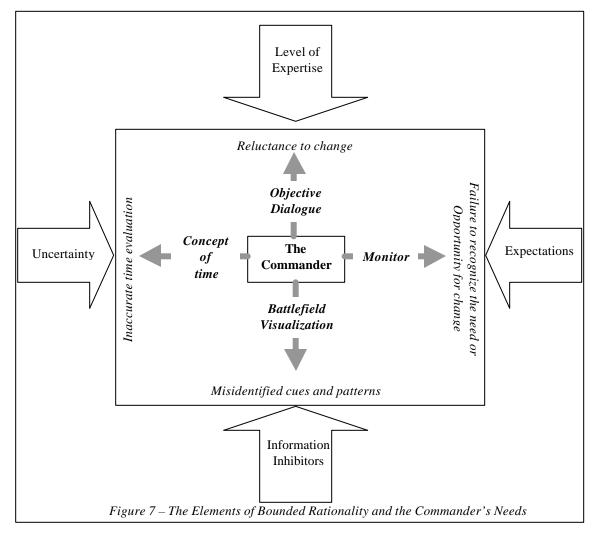
This examination of the aspects of bounded rationality provides insight into what the commander needs to make combat-action decisions. Specifically, the analysis above suggests four trends that commanders must actively attempt to avoid – inaccurate time evaluation, the failure to recognize the need/opportunity for change, the misidentification of cues and patterns, and the reluctance to change. Counters to these trends drive the commander's needs. Since "no C2 process is better than the commander running it," the commander must establish processes that allow him to stretch the 'bounds' on his rationality. [17]

Based on this analysis, the four things a commander needs are: comprehensive *battlefield visualization*, a process for *monitoring*, a *conceptualization of time*, and *objective dialogue*. (See figure 7, below.) A review of the same research that describes the cognitive limitations of commanders suggests these needs. Furthermore, the writings of contemporary military professionals illustrate and confirm these same four subjects. The remainder of this section

defines these four needs, and provides an objective means of measurement; the following section demonstrates how the MDMP can fulfill them.

Battlefield Visualization

The first commander's need is comprehensive battlefield visualization. Battle field visualization refers to the process by which a commander conveys his mental image of how he sees a fight progressing through time and space. Effective battlefield visualization prevents the bounding effects of information inhibitors from negatively affecting the unit.

Figure 7 – The Elements of Bounded Rationality and the Commander's Needs

Establishment of battlefield visualization is suggested as the remedy for information inhibitors by both psychological research and military professionals. Cognitive psychologists refer to this process as "dynamic imaging" and suggest, "the very nature of human

communication is one that promotes image building."[18] Contemporary military professionals

refer to battlefield visualization as "seeing" or "vision," and describe it as "essential, because the

vision becomes the plan."[19]

To enhance combat-action decision-making, battlefield visualization must provide a shared,

common framework of reference. Although battlefield visualization begins with the

commander's internal image of the situation, it is "of no value if not imparted to, or understood

by subordinates."[20] By sharing the process with his commanders and staff, the commander

establishes the context for his decision-set by providing "the structure within which decisions can

be made."[21] Furthermore, this helps subordinates understand what information the commander

needs in order to make decisions, and prevent informational inhibitors from causing the

misidentification of cues.

Monitoring

The structure provided by battlefield visualization enables the proper execution of the

commander's second need – a process for monitoring. Monitoring is the "process of discerning

what's happening, and what it means."[22] Effective monitoring in conjunction with battlefield

visualization counteracts the expectations-category of bounded rationality.

Psychologists and military authors support this commander's need as well. Cognitive

psychology clearly establishes the need for monitoring; research on expertise and experience

demonstrates that "decision makers must program actions during analysis to regulate action."[23]

Likewise, one former battalion commander emphasized the need for monitoring as the "safety

check" on intuitive decision-making.[24]

To enhance combat-action decision-making, a monitoring process must focus on the

commander's specific requirements and "provide information in a flexible…rapid way."[25] A

direct tie-in to the commander's decisions demonstrates focus on specific requirements, and lets

him know if his intuitively-based assumptions are false. Flexibility and speed imply a process

that facilitates rapid re-direction, and a careful consideration of time-distance factors.

Conceptualization of Time-Space

The planning of time-distance factors in support of the monitoring process emphasizes the criticality of the commander's third need, a conceptualization of time-space. A conceptualization of time-space means more than just knowing how long actions take, it means knowing *when* to decide, and managing the time available effectively. A firm concept of time prevents the bounding limitations of uncertainty from inaccurately estimating time, leading to decisions made too late, or too early.

Cognitive psychologists and military professionals agree that commanders must have an accurate conceptualization of time – "true experts know <u>when</u> to decide."[26] They also agree that this conceptualization is not just an emphasis on doing things quickly. Research on decision-making experts stresses that the time advantage gained by experienced decision-makers stems from their knowledge of the time-space relationship of actions. This means when a selected course of action becomes unfeasible, experienced commanders "must be able to determine if there is enough time" to implement a contingency plan.[27]

Enhancing combat-action decisions through conceptualization of time requires that commanders consider how long given actions *take* to happen, how long it takes to *know* they've happened, and how long they need to *react*. From this consideration, they are able to plan the use of time, streamline monitoring processes, and overtly adjust their information requirements. The net effect of this process is an idea of when decisions must be made, shared between the commander and staff, which reduces the effect of uncertainty.

Objective Dialogue

The commander's final need is objective dialogue – a process of interaction with his staff or subordinate commanders to enable a deeper understanding of the situation. This does not infer commanders and subordinates debating about the finer points of a mission. Objective dialogue is the process by which a staff enhances, or increases, the experience level of the commander by discussing the positive and negative aspects of a potential decision. By exposing the commander

– virtually – to new or unfamiliar situations through mental simulation, objective dialogue counteracts the limiting effects of experience, and assists in preventing the effects of uncertainty, expectations and information inhibitors as well.

As with the other three needs, both cognitive and military scientists demonstrate the validity of this commander's need. Psychologists specializing in learning theory view the discussion of potential courses of action as the dialectical counterpoise to a commander's experience. Discussion of options reinforces understanding gained through similar experience.[28] Military theorists describe this in a simpler manner, explaining it as necessary for providing the commander [an] understanding of the facts and problems."[29]

Objective dialogue enhances combat action decision-making in three ways. First, it deepens the shared understanding of the commander and the commanded. Second, it deepens the commander's experience base by allowing him to mentally explore other options and different perspectives. Last, the examination and discussion of options can lower the commander's reluctance to change. This occurs because objective dialogue works directly against the primary cause of "decision-conflict" – the commander's perception of a lack of options.

To briefly summarize this section, the four things a commander needs for effective combat-action decision-making are battlefield visualization, monitoring, a time-space conceptualization, and objective dialogue. These needs are the logical counters to the shortcomings inherent in intuitive decision-making, as illustrated through the concept of bounded rationality. Although these four needs directly affect a commander's combat-action decisions, all four processes begin during tactical planning. Therefore, in order to enhance combat-action decision-making, the MDMP must account for these needs. The following section shows how it does.

Analysis of the MDMP

The MDMP enhances combat-action decision-making by directly addressing the needs of the commander. Battlefield visualization, monitoring, conceptualizing time-space, and objective

dialogue are all built into the MDMP. Since commanders use intuitive processes to make combat-action decisions, the value of using the MDMP in tactical planning "is that it adds to the bank of knowledge and understanding on which the commander will base his intuitive decisions."[30]

First, the MDMP enhances a commander's ability to establish battlefield visualization. As analysis in the section above demonstrated, battlefield visualization enhances combat-action decision-making when it provides a shared, common framework of reference. The MDMP affects battlefield visualization through the 'Mission Analysis' step and the 'COA Analysis' step.

'Mission Analysis' enhances battlefield visualization by establishing a common frame of reference between the commander and the entire staff, and identifying the "full range of problems and opportunities in the situation."[31] During this step, the commander begins the visualization process, imparting his perception of how he wants the fight to occur through his commander's intent and his planning guidance to the staff. The staff contributes to this visualization by providing purposive analysis of the situation to refine the commander's vision, and by transmitting the commander's visualization to subordinates in the form of a warning order.[32] Research on tactical planning by the Army Research Institute indicates that the "early stages of planning" are critical for establishing a shared understanding of the "battlefield situation."[33]

The 'COA Analysis' step enhances battlefield visualization by allowing the commander and staff to cognitively simulate proposed events. By its very design, the wargaming process provides a visualization of how the fight will unfold, helping the unit to develop "as near an identical vision of the battle as possible."[34] Research by cognitive psychologists confirms that mental simulation is "useful method to develop understanding."[35]

The second way the MDMP addresses commanders' needs is by enhancing his ability to establish monitoring processes. Effective monitoring processes focus on the specific needs of the commander, and provide flexible, timely information. The MDMP accomplishes this through the development of CCIR, reconnaissance planning, and commander's guidance.

Units begin the monitoring process by developing CCIR. Staffs specifically design CCIR to support two things: the commander's battlefield visualization and his ability to make decisions. CCIR "narrow the scope" of reconnaissance and information management, and "reduce the abundance of information to that critical information needed [by commanders] to make timely and accurate decisions."[36] CCIR focus on the specific needs of commanders.

After CCIR are established, the monitoring process continues with reconnaissance planning. Reconnaissance planning occurs simultaneously with the 'Mission Analysis' step. By specifying this planning early, the MDMP maximizes a units' ability to increase the speed of necessary feedback.[37] Rapid feedback is essential to effective monitoring.

Finally, the MDMP facilitates flexible modification of the monitoring process during tactical planning. The MDMP specifies the ability of commanders to provide guidance at the beginning of every process step, and at the conclusion of every briefing. This directed interaction between the commander and his staff creates the opportunity for iterative assessments of the current situation, based on recent information. As the commander receives this information, he is able to direct changes to his CCIR. Altogether, CCIR, reconnaissance planning, and commanders' guidance establish an effective mechanism for commanders to designate, execute, and refine their ability to monitor.

The MDMP also enhances combat-action decision-making by facilitating the commander's conceptualization of time-space. Effective time-space concepts enable effective use of available time by analyzing from three perspectives: how long actions take, how soon changes can be known, and the length of time to react. The MDMP accomplishes this by continually directing the analysis of time, and through 'COA Analysis.'

Although admittedly time-consuming, the MDMP emphasizes the criticality of time to decision-making. In the description of every step, the MDMP directs commanders and staffs to analyze available time, in order to enable the most effective use of this finite resource. Research in cognitive psychology suggests that repetition or emphasis on a particular decision-making

condition (such as time) can result in the adoption of "meta-goals" – overarching measurements of success.[38] In the context of tactical planning, this implies that the constant emphasis on timeliness could cause staffs to emphasize speed in every facet of planning.

The wargaming process of the 'COA Analysis' step also contributes to the establishment of the commander's concept of time-space. The in depth analysis of the iterative action-reaction-counteraction cycle of wargaming provides the best method for forecasting how long actions will take. Staff's can also provide reasonable estimations, based on time-distance, of how soon (or late) information concerning changes could become available. In fact, this is an integral part of the IPB process.[39] Further refinement of the concept of time result from "thorough consideration of branches and sequels."[40] Considered together, the MDMP's emphasis on time and the detailed analysis of wargaming provide commanders with a firm estimation of time.

The MDMP also incorporates the final commander's need– objective dialogue. As the analysis above explained, objective dialogue requires interaction between the commander and staff that enables the dialectical process of experiencing and understanding. The MDMP involves objective dialogue throughout all seven steps, however it is emphasized in 'COA Development,' 'Analysis,' and 'Selection.'

Objective dialogue begins in earnest at the conclusion of the mission analysis when the commander issues his planning guidance. The commander bases this guidance on his experience. The staff then develops, analyzes, and compares courses of action, based on this guidance, and then briefs the commander on their recommendation. The conduct of this briefing generally elicits objective dialogue between the commander and staff on the finer points of analysis, and how they arrived at their conclusion.

FM 101-5 (1997) notes that the spirit of wargaming "stimulates ideas and provides insights that might not otherwise be discovered." These ideas and insights form the basis of objective dialogue. Furthermore, the commander may elect to inject himself into the development-analysis-comparison process, thereby increasing the level of dialogue.

The net effect of these discussions is twofold. First, the staff exposes the commander to ideas, concepts, and/or factors that he may not have considered. If commanders attend wargaming, they can gain a deeper understanding of other options, and the conditions required for making these other options viable. Second, by explaining these other options (a normal function of the COA decision brief), they lessen a commander's tendency to resist change. As noted above, the primary cause of resistance is a decision-maker's commitment to a selected action. Therefore, the objective dialogue inherent in the presentation of other options, demonstrates to the commander that there are other ways to successfully accomplish the mission.

Summary

Decision-making is a human activity; therefore, analysis of decision-making naturally involves examination of the human dimension. This is especially vital in the context of tactical decision-making described in this research, which demonstrates that commanders make combat-action decisions intuitively.

Analysis of intuitive decisions reveals potential shortcomings, driving specific needs for commanders at the tactical level. By addressing these needs – battlefield visualization, monitoring, time-space conceptualization, and objective dialogue – the MDMP demonstrates how it enhances combat-action decision-making.

The research in this and the previous chapter suggest that the MDMP is a solid tool for tactical units. The MDMP aligns with keystone doctrine, proving that it incorporates the lessons learned from nearly two centuries of warfare. Furthermore, the MDMP accounts for the psychological needs of commanders. Why then do military professionals still express dissatisfaction with the MDMP? The answer to this question appears to involve how the MDMP is employed; perhaps it is not the 'tool,' but that hand that holds it.

---

[1] *FM 100-5, Operations* (1993), 2-15.
[2] (Gen) Charles Krulak, "Cultivating Intuitive Decision Making," 19.
[3] Gary Klein, *Making Decisions in Natural Environments, 2.*
[4] John F. Schmitt (Maj, USMCR), "How we Decide," *Marine Corps Gazette*, October 1995, 18.

[5] Klein, *Sources of Power*, 25.

[6] John Schmitt, "How We Decide," 18.

[7] Herbert Simon, *Administrative Behavior*, 38-40.

[8] James P. Kahan, Robert Worley, and Cathleen Stasz, *Understanding Commanders' Information Needs*, (Santa Monica, CA: The Rand Corporation), 1989, 9.

[9] Patricia A. Jacobs and Donald P. Gaver, *Human Factors Influencing Decision Making*, (Monterey, CA: U.S. Naval Postgraduate School), 1998, 70-72. An excellent example of this is also provided in the interviews of four U.S. Army tactical-level commanders, and how they developed CCIR, included in: Susan P. Kellett-Forsyth, "Commander's Critical Information Requirements: The Key to a Commander's Battle Image." Monograph prepared for the School of Advanced Military Studies, (Fort Leavenworth: U.S. Army Command and General Staff College), 1993, 5.

[10] Jacobs and Gaver, 70 and 74.

[11] John Payne et al, "Behavioral Decision Research," 95-97, 114. The article notes (p.114) that research on the concept of "framing effects" offers "basic perceptual principles" that demonstrate how people "code," or explain, new information from a previously established point of reference. See also: Kolb, "Problem Management," p.139.

[12] Ibid, 106.

[13] Kellet-Forsyth, 21.

[14] Keith J. Holyoak, "Symbolic Connectionism: Toward Third-Generation Theories of Expertise," in *Towards a General Theory of Expertise*, ed. by K. Anders Ericsson and Jacqui Smith, (Cambridge: Cambridge University Press) 1991, 310.

[15] Irving L. Janis and Leon Mann, Decision Making, (New York: The Free Press), 1978, 50; Jacobs and Gaver, 42.

[16] Ibid, 50 and 286. The "decision conflict" concept is part of a larger theory called the "Conflict Model of Decision Making," which describes reasons why decision-makers display irrational behavior when acting under stress. The book explains that commitment to a selected course of action is a strong motivator for refusing to change. Examples cited in the book from clinical study include smokers, overweight individuals and others with habits/tendencies that they admit are self-destructive, but are unable to change.

[17] Thomas P. Coakley, *Command and Control for War and Peace*, (Washington, D.C.: National Defense University Press), 1992, 95.

[18] Kahan et al, *Understanding Commanders' Information Needs,* 15 and 23*;* Kolb, "Problem Management: Learning From Experience," 128.

[19] (LTC) Jeffrey W.S. Leser, "Battle Command: Vision for Success," *Military Review*, Mar-Apr 1997, 56; Jon J. Fallesen, James W. Lussier, and Rex R. Michel, *Tactical Command and Control Process*, (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), 1992, 2,3.

[20] Fallesen et al, *Tactical Command and Control Process*, 4.

[21] Leser, "Battle Command: Vision for Success," 56.

[22] Fallesen et al, *Tactical Command and Control Process*, 17.

[23] Dietrich Dorner and Julia Scholkopf, "Controlling Complex Systems," in *Towards a General Theory of Expertise*, ed. by K. Anders Ericsson and Jacqui Smith, (Cambridge: Cambridge University Press) 1991, 236.

[24] Charles Rogers, "Intuition: An Imperative of Command," 40.

[25] Kahan et al, *Understanding Commanders' Information Needs,* 14.

[26] Dorner and Scholkopf, "Controlling Complex Systems," 226.

[27] Fallesen et al, *Tactical Command and Control Process*, 18.

[28] Kolb, "Problem Management: Learning From Experience," 126.

[29] Rogers, "Intuition: An Imperative of Command," 48.

[30] Ibid, 48.

[31] Kolb, 113.

[32] *FM 101-5 Staff Organization and Operations* (1997), 5-5 to 5-11; John Foss (Gen, ret.) "Command", *Military Review*, Jan-Feb 1997, 66-67. Reference includes previous sentence.

[33] Fallesen et al, *Tactical Command and Control Process*, 2.

[34] *FM 101-5* (1997), 5-16.

[35] Stanley M. Halpin, *The Human Dimensions of Battle Command: A Behavioral Science Perspective on the Art of Battle Command*, (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), 1996, 21.

[36] Kellett-Forsyth, 5.

[37] Fallesen et al, *Tactical Command and Control Process*, 18.

[38] Payne et al, "Behavioral Decision Research," 90. The authors do note, however, that meta-goals are often contradictory. For example, a staff might have both "timeliness" and "maximize accuracy" as meta-goals, which naturally lead to confusion.

[39] U.S. Army, *Field Manual 34-130, Intelligence Preparation of the Battlefield*, (Washington D.C.: Headquarter, U.S. Army), 1994, 2-45 to 2-48.

[40] Halpin, *The Human Dimensions of Battle Command*, 21.

CHAPTER 6

Conclusion

Doctrine is methodology, and if it is to work, all military elements must know, understand, and respect it.

Trevor Depuy*, Encyclopedia of Military History and Biography*

Based on the evidence provided in the previous chapters, this paper concludes that the current MDMP is an appropriate tool for the conduct of tactical planning. In short, problem-solving theory, considered in the context of the tactical C2 system, justifies the use of an analytical decision-making model during tactical planning. Furthermore, the specific analytical model employed by the U.S. Army – the current MDMP – meets both the guidance specified in keystone doctrine regarding tactical planning and supports the cognitive needs of commanders. Therefore, use of the MDMP during tactical planning should enhance the ability of brigade and battalion commanders in making combat-action decisions.

The fact that the MDMP is a doctrinally and cognitively sound process, however, does not mean that it is problem-free. Observations and analysis from several sources suggest that many tactical units have problems when applying the process. Others go as far as to suggest that tactical "commanders find the…decision making process to be of limited applicability."[1] This incongruence between the MDMP's theory and the application of that theory by competent professionals creates a dilemma for this research.

The purpose of this concluding chapter is to resolve this dilemma. Although a full examination of how tactical units apply (or misapply) the MDMP is beyond the scope of this paper, observations of tactical planning performance suggest several common problems. Briefly categorizing these problems and comparing them with the analysis of the previous three chapters,

enables the recommendation for improvements on how the MDMP is doctrinally presented, taught, and executed.

Doctrine versus Reality: The MDMP in Action

The evidence of the three preceding chapters demonstrates the theoretical effectiveness of the current MDMP. In reality, however, tactical units often fail to achieve this effectiveness. Unit evaluations and current professional dialogue suggest four negative trends in tactical planning performance.

Data on tactical unit planning performance comes from several sources. These sources include the observer/controllers at the National Training Center (NTC), the behavioral scientists of the U.S. Army Research Institute for Behavioral and Social Sciences (ARI-BSS), and the Center for Army Lessons Learned (CALL). Data collected by these three sources represent a wide variety of observations of tactical units, under many different sets of conditions.

Despite this variety of observations, some common trends emerge from all three sources. NTC, ARI-BSS, and CALL all appear to generally agree that:

    1) Tactical units do not understand and/or follow current MDMP doctrine.[2]

    2) Tactical staffs are inexperienced, which leads to commanders and S-3s doing all the work.[3]

    3) Tactical staffs fail to recognize and/or pass information relevant to commanders' decisions.[4]

Dialogue exhibited in contemporary professional journals reflects a fourth trend. In short, these professionals view analytical decision-making and intuitive decision-making as completely separate, antithetical processes. Many officers, frustrated with tactical planning problems like the three outlined above, suggest:

    4) Tactical units need two (one analytical/one intuitive) decision-making processes.[5]

The combined effect of these four trends is the ineffectual application (or complete misapplication) of the MDMP. Stated another way, these observations suggest that tactical staffs violate the criteria established by keystone doctrine for effective tactical planning, *and* ignore the cognitive needs of commanders for effective combat-action decision-making (see figure 8, below).

Planning Fundamentals of U.S. Army Keystone Doctrine	*Tactical Commanders' Cognitive Needs*
- Flexibility	- Battlefield Visualization
- Timeliness	- Monitoring
- Effectiveness	- Concept of Time-Space
- Focused Analysis	- Objective Dialogue

Figure 8 – A Review of Keystone Doctrine's Planning Fundamentals and the Cognitive Needs of Tactical Commanders

The first trend (failing to understand/apply the MDMP doctrine) suggests that staffs fail to conduct the basic processes of course of action generation and commander-directed analysis. This detracts from the planning concept of *focused analysis* established by keystone doctrine, and limits the commander's needs for *objective dialogue* and effective *monitoring.*

The second trend (inexperienced staffs that force commanders/S-3s to conduct MDMP alone) affects the same doctrinal fundamentals and cognitive needs. Additionally, this problem prohibits effective use of *time*, and prevents the creation of shared *battlefield visualization*.

The third trend (failure to provide relevant information to commanders) implies that during both planning and execution, staff members are failing to support the commander's ability to decide. Without necessary information, commanders cannot see, react or anticipate actions during the fight. This reduces planning *effectiveness*, and *flexibility*, and directly violates the commander's needs for *monitoring*, and *time-space conceptualization*.

The final trend (desiring establishment of separate analytical and intuitive processes) displays a fundamental misunderstanding of the tactical C2 system. Specifically, this problem violates the

concept of linked decision-sets. The use of two processes leads to the emphasis of one, at the expense of the other, instead of recognizing their interrelated nature.

Considered together, these four negative trends suggest a larger problem with the MDMP – the doctrine is sound, but not understood. This leads to ineffective training and sorry execution of the process. As the quote at the beginning of this chapter suggests, understanding is a prerequisite for working doctrine.

Recommendations

This final section outlines specific recommendations for increasing understanding of the current MDMP among U.S. Army tactical leaders. These recommendations reflect the precepts of keystone doctrine and the cognitive processes of problem-solving analyzed in this paper. The unifying basis of these recommendations is that military professionals at the tactical level must understand "what is generally invisible to military officers" – the principle theories behind human decision-making and how they apply to the MDMP.[6]

Understanding the current MDMP – the U.S. Army's current decision-making doctrine requires three things: a clear presentation of doctrine, training that accounts for the human dimension of decision-making, and execution that properly focuses staffs.

Clear Presentation of Doctrine. In its current structure and format, *FM 101-5* does not clearly present the MDMP. Specifically, the current manual fails to provide an explanation of problem-solving or decision-making theories; it does not effectively integrate decision-support techniques; and its discussion of time-saving techniques is confusing. All four of the negative trends examined in the previous section are the direct result of these shortcomings.

Shortcomings in the presentation of doctrine lead to over-emphasis on particular parts of the MDMP, at the expense of some of the more important aspects of the process. For example, the failure to address the theoretical underpinnings of problem-solving and decision-making prevents comprehension of decision-sets. This leads concerned professionals to "abandon [analytical]

methods in favor of alternative solutions, usually some form of [intuitive approach]" without recognizing the basic, theoretical link between the two.[7]

Likewise, the confusing presentation of time saving techniques pressures planners in time-constrained environments to abandon analysis altogether.[8] Techniques such as developing a single COA, or the restriction of planning to key individuals maximize time, but sacrifice the objective dialogue and analysis that "adequately stimulates [the commander's]thought and judgment."[9]

Correcting the unclear presentation of the MDMP necessitates the restructure of U.S. Army command and control doctrine as a cohesive system. This restructure should include a comprehensive theory that demonstrates the interconnectivity of Battle Command, analytical tactical planning, and intuitive combat-action decision-making, and the concept of decisions sets. An overarching tactical C2 model, such as the one presented in Chapter 3, could provide a useful cognitive framework.

Training that accounts for the human dimension of decision-making. Current training processes on decision-making at the tactical level do little to account for the human dimension. Chapter 5 of this paper clearly established the importance of the human dimension in decision-making. However, "much that is professionally written about military decision-making…suggest[s] that the response to a military…situation [is] different in kind from all other human responses."[10]

The current MDMP incorporates methods such as group problem-solving, detailed mission analysis, and the objective dialogue inherent in wargaming that overcome humanistic shortcomings such as bias and the effects of stress. However, current doctrine, and the training methods based upon it, attributes no emphasis to these processes as methods for overcoming human error and bias. "Unless training is supplemented by understanding" execution is flawed.[11]

The resolution to this problem requires two actions. First, the restructure of tactical command and control doctrine, and rewriting of FM 101-5 suggested above should also directly

address the human dimension. This would empower the second action – the revision of tactical decision-making instruction. Since "in the last analysis, a human being has to make the decision," specific methods for accomplishing this revision are excellent candidates for further research.[12]

Execution that properly focuses staffs. Several intensive research efforts point out that during execution, staffs are not properly focused or managed.[13] In the time-constrained environments of tactical combat, the lack of focus and/or management contributes greatly to the trend of commanders and S-3's performing MDMP alone.[14] However, as the evidence in Chapter 5 suggests, over-reliance on the commander's experience is chimerical and counterproductive.

Poorly managed staffs, accustomed to relying on their commanders, lack shared battlefield visualization. The lack of visualization prevents them from effectively monitoring situations, resulting in the 'failure to pass relevant information' trend. Information that staffs do pass is "based on the judgment of personnel in the tactical operations center," and not the needs of the commander.[15]

Ensuring that staffs remain properly focused demands specific training and guidance for field grade officers. FM 101-5 (1997) assigns this role to the chief of staff /executive officer; lieutenant colonels and majors in tactical brigades and battalions.[16] However, the focus of tactical decision training at the U.S. Army Command and General Staff College is on planning and deciding – not managing the efforts of subordinate staff members. Incorporation of effective management techniques into the curriculum at Fort Leavenworth could positively correct this shortcoming.

Conclusion

With the current MDMP, the U.S. Army has armed its brigades and battalions with a single, but a potentially powerful, decision-making tool. Like any tool, the MDMP's use is absolutely dependant on the hands that hold it – a hammer can build or destroy. Analysis of the MDMP against objective criteria establishes its validity in tactical planning, and its positive effects on

combat-action decision-making. However, like the dual-purpose hammer, the human dimensions

of decision-making can inadvertently limit the MDMP's effectiveness. Understanding of the

theoretical basis, and human dimension of decision-making is critical to proper use. As Winston

Churchill noted:

> The problem can seldom be calculated on paper alone, and never copied from examples of the past. Its highest solution must be evolved from the eye and brain and soul of a single man, which from hour to hour are making subconsciously all the unweighable adjustments, no doubt with many errors, but with an ultimate practical accuracy.... That is why critics and analysts write so cogently, and yet successful performers are so rare.[17]

[1] J. W. Lussier and D.J. Litvec, Battalion Commanders Survey: Tactical Commanders Development Course Survey, (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), 1992, 36-37.

[2] 'Failure to follow doctrine' included modification and/or non-use of the process or critical steps of the process. 'Lack of understanding' was exhibited by units who followed the process, but could not explain *why* they were doing *what* they were doing. (Jon Grossman, B*attalion-Level Command and Control*," 7-8; John J. Fallesen, *Overview of Army Tactical Planning Performance Research*, Technical Report 984, (Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences), 1993, 10, C-2. Fallesen cites both ARI research, and includes a summarizing table of CALL data in Appendix C.)

[3] This observation comes most directly from the Grossman NTC study where actual cases of commanders and S-3s taking over the process were recorded. Similar observations are made in both the ARI-BSS and CTC studies of units who either ignored or excluded various staff officers. (Grossman, 9; Fallesen, 15, B-2.)

[4] Failure to pass relevant information is primarily an observation of Fallesen's ARI study and his compilation of CTC data (appendix C). Grossman makes similar observations when he notes that over "two-thirds of SITREPs…were initiated by the [battalion] commander requesting information." (Grossman, 17-18; Fallesen, 35, C-2.)

[5] For examples see: (Maj) B. Don Farris, "Defining a Combat Decision-Making Process at the Tactical Level of War and Operations Other Than War," MMAS Thesis (Fort Leavenworth: U.S. Army Command and General Staff College), 1995, 102; (Maj) Wilson A. Shoffner, "The Military Decision-Making Process: Time for a Change," Monograph prepared for the School of Advanced Military Studies, (Fort Leavenworth: U.S. Army Command and General Staff College), 1999, 12; (Gen) Charles Krulak, "Cultivating Intuitive Decision Making," 19;

[6] (Lt Col) S.L.C. Diggins, "The Estimate and the Emperor's New Clothes," *The British Army Review*, no. 124, Spring 2000, 5.

[7] Ibid.

[8] Although the MDMP listed specific methods for reducing/shortening the process, it also states that "there is only one process," and "omitting steps of the MDMP is not the solution." Many officers view these statements and suggested time-saving techniques as contradictory.

[9] Quotation from: William Reitzel, *Background to Decision Making,* 100. See also: Gregory T. Banner, "Decision-Making: A Better Way," Military Review, Sep-Oct 1997, 53; Fallesen, *Overview of Tactical Planning Research*, 14. Banner describes an example of a single COA methodology. Fallesen points out that research among Tactical Commanders Development Course instructors revealed that student-officers felt the MDMP process was acceptable, but that it needed to be done faster. Subsequent analysis acknowledged the need to reconcile speeding the process with the need for detailed analysis.

[10] William Reitzel, *Background to Decision Making,* 32-33.

[11] Ibid, 17.

[12] Ibid, 99.

[13] For examples see: Fallesen, O*verview of Tactical Planning Performance Research*, 15; Marvin Thordsen, et al, "A Knowledge Elucidation Study of Military Planning," 39.

[14] Fallesen, *Overview of Tactical Planning Performance Research,* 15.

[15] (Maj) N.K. Chung, Jr., "An Analysis of Command and Control Doctrine for the Infantry Battalion During the Attack," 69.

[16] *FM 101-5* (1997), 5-2.

[17] Winston Churchill cited in: William Reitzel, *Background to Decision Making,* 103. (No reference listed).

SELECTED BIBLIOGRAPHY

BOOKS

Bertalanffy, Ludwig von. General Systems Theory: Foundations, Development, Applications. New York: George Braziller, Inc., 1968. Revised, New York: George Braziller, Inc., 1993.

Camerer, Colin F. and Eric J. Johnson. "The Process-Performance Paradox in Expert Judgment," in *Toward a General Theory of Expertise*. Edited by K. Anders Ericsson and Jacqui Smith. Cambridge: Cambridge University Press, 1991.

Clausewitz, Carl. *On War.* Edited and Translated by Michael Howard and Peter Paret. Princeton: Princeton University Press, 1976.

Coakley, Thomas P. *Command and Control for War and Peace.* Washington, D.C.: National Defense University Press, 1992.

Dorner, Dietrich. *The Logic of Failure.* Translated by Rita and Robert Kimber. New York: Metropolitan Books, 1996.

Dorner, Dietrich and Julia Scholkopf. "Controlling Complex Systems; or, Expertise as 'Grandmother's Know-How,'" in *Toward a General Theory of Expertise*. Edited by K. Anders Ericsson and Jacqui Smith. Cambridge: Cambridge University Press, 1991.

Dupuy, Trevor N. "Theory of Combat," in *Brassey's Encyclopedia of Military History and Biography*, 1994.

Ewell, Julian J. and Ira A. Hunt. *Sharpening the Combat Edge: The Use of Analysis to Reinforce Military Judgment.* Washington D.C.: U.S. Government Printing Office, 1974. Reprint, Washington, D.C.: U.S. Government Printing Office, 1995.

Hittle, James D. *The Military Staff: Its History and Development.* Westport: Greenwood Press, Publishers, 1975.

Holyoak, Keith J. "Symbolic Connectionism: Toward Third-Generation Theories of Expertise," in *Toward a General Theory of Expertise*. Edited by K. Anders Ericsson and Jacqui Smith. Cambridge: Cambridge University Press, 1991.

Infantry Journal, Inc. *Infantry in Battle.* 2d ed. Washington D.C.: U.S. Government Printing Office, 1939. Reprint, Richmond: Garrett & Massie, 1993.

Janis, Irving L. and Leon Mann. *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment.* New York: The Free Press, 1977.

Klein, Gary A. *Sources of Power.* Cambridge, MA: The MIT Press, 1999.

Kolb, David A. "Problem Management: Learning From Experience," in *The Executive Mind*. Edited by Suresh Srivastva. San Francisco: Jossey-Bass Publishers, 1983.

Kolb, David A. and Donna M. Smith. *User's Guide for the Learning Style Inventory*. Boston: McBer and Company, 1986.

Marshall, S.L.A. *Men Against Fire: The Problem of Battle Command in Future War.* Gloucester: Peter Smith Publishers, 1947. Reprint, Gloucester: Peter Smith Publishers, 1978.

Mintzberg, Henry. *The Rise and Fall of Strategic Planning,* New York: The Free Press, 1994.

Reitzel, William, *Background to Decision Making.* Newport: Naval War College, 1958.

Saaty, Thomas L. *Decision Making for Leaders.* Beaumont: Lifetime Learning Publications, 1982.

Senge, Peter M. *The Fifth Discipline.* New York: Currency Doubleday, 1990.

Simon, Herbert A. *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations.* New York: The Free Press, 1976.

Sun Tzu. *The Art of War.* Translated by Ralph D. Sawyer. Boulder: Westview Press, 1994.

PERIODICALS

Antal, John F. "It's Not the Speed of the Computer That Counts! The Case for Rapid Battlefield Decision-Making." *Armor*, (May-June, 1998): 12-16.

Banner, Gregory T. "Decision Making – A Better Way." *Military Review*, (September-October 1997): 53-55.

Beach, Lee R. and Terrence R Mitchell, "A Contingency Model for the Selection of Decision Strategies," *Academy of Management Review,* vol. 3 (1978): 439-449.

Diggins, S.L.C., "The Estimate and the Emperor's New Clothes," *The British Army Review,* no. 124 (2000): 4-12.

Erev, Ido, Gary Bornstein, and Thomas S. Wallsten. "The Negative Effect of Probability Assessments on Decision Quality," *Organizational Behavior and Human Decision Making Processes,* no. 55 (1993): 78-94.

Foss, John W. "Command." *Military Review*, (January-February 1997): 66-70.

Howell, W.C., "Engineering Psychology in a Changing World," *Annual Review of Psychology*, vol. 44 (1993): 241-258.

Johnston, Joan H., Driskell, James E., and Salas, Eduardo. "Vigilant and Hypervigilant Decision Making," *Journal of Applied Psychology*, vol. 82 (1997): 614-622.

Klein, Gary. "Strategies of Decision Making." *Military Review*, (May 1989): 56-64.

Klein, Gary and Major John F. Schmitt. "How We Plan." *Marine Corps Gazette*, (October, 1995): 18-26.

Krulak, Charles C. "Cultivating Intuitive Decisionmaking." *Marine Corps Gazette*, (May, 1999): 18-22.

Leser, Jeffrey W.S. "Battle Command: Vision for Success." *Military Review*, (March-April 1997): 52- 59.

Payne, John W. and James R. Bettman, "Behavioral Decision Research: A Constructive Processing Perspective." *Annual Review of Psychology*, vol.43 (1992): 87-116.

Rector, George E. "Leadership and Decisionmaking." *Marine Corps Gazette*, (October, 1995): 21-23.

Reisweber, Deborah. "Battle Command: Will We Have It When We Need It? *Military Review*, (September-October 1997): 49-58.

Rogers, Charles T. "Intuition: An Imperative of Command." *Military Review*, (March, 1994): 38- 50.

Simon, Herbert A. "Background of Decision Making," *Naval War College Review* (November, 1957): 1-24.

Storr, Jim. "Real People, Real Decisions: Designing HQs to Win Wars." *British Army Review*, no. 123 (1999): 7-19.

Weis, Jeffrey S. "Information Mismanagement: The Quest for Certainty on the Battlefield." *Marine Corps Gazette*, (October, 1998): 22-23.

Wilson, Timothy D. and Schooler, Jonathan W. "Thinking Too Much: Introspection Can Reduce The Quality of Preferences and Decisions," *Journal of Personality and Social Psychology*, vol. 60, no. 2 (1992): 181-192.

MONOGRAPHS, THESES, AND DISSERTATIONS

Antal, John. "An Analysis of the Tactical Orders Process," MMAS Thesis, U.S. Army Command and General Staff College, 1990.

Chung, N.K., Jr. "An Analysis of Command and Control Doctrine for the Infantry Battalion During the Attack." MMAS Thesis, U.S. Army Command and General Staff College, 1975.

Farris, B. Don, II. "Defining a Combat Decision-Making Process at the Tactical Level of War and Operations Other than War." MMAS Thesis, U.S. Army Command and General Staff College, 1995.

Kellett-Forsyth, Susan P. *Commander's Critical Information Requirements: The Key to a Commander's Battle Image*. SAMS Monograph, U.S. Army Command and General Staff College, 1993.

Kievennar, Henry A. "Accelerated Decision Making at the Task Force Level." MMAS Thesis, U.S. Army Command and General Staff College, 1997.

Polk, Robert B. *A Critique of the Boyd Theory – Is it Relevant to the Army?* SAMS Monograph, U.S. Army Command and General Staff College, 1999.

Reilly, Gregory D. "How Tactical Experience Affects Confidence About Combat Decision Making." MMAS Thesis, U.S. Army Command and General Staff College, 1997.

Shoffner, Wilson A. *The Military Decision Making Process – Time for a Change,* SAMS Monograph, U.S. Army Command and General Staff College, 1999

TECHNICAL AND SPECIAL STUDY REPORTS

Crumley, Lloyd M. and Mitchell B. Sherman. *Review of Command and Control Models and Theory.* Technical Report 915. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1990. DTIC, AD-A230 105.

Fallesen, John J. *Overview of Army Tactical Planning Performance Research*. Technical Report 984. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1983. NTIS, AD-A273 273.

Fallesen, John J., James W. Lussier, and Rex R. Michel. *Tactical Command and Control Process*. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1992. NTIS, AD-A255 036.

Grossman, Jon. *Battalion-Level Command and Control at the National Training Center.* Santa Monica: Rand, 1994.

Halpin, Stanley M. The Human Dimension of Battle Command: A Behavioral Science Perspective of Battle Command. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1996.

Jacobs, Patricia A. and Donald P. Gaver. *Human Factors Influencing Decision Making.* Monterey: Naval Postgraduate School, 1998. NTIS, AD-A351 910.

Kahan, James P., D. Robert Worley, and Cathleen Stasz. *Understanding Commanders' Information Needs.* Santa Monica: Rand, 1989.

Klein, Gary. *Making Decisions in Natural Environments*. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1997.

Lickteig, Carl W., Bruce S. Sterling, Gary S. Elliott, Joe E. Burns, and Joe E. Langenderfer, *Assessing Battle Command Information Requirements and the Military Decision Making Process in a Concept Experimentation Program,* Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1998. NTIS, AD-A359 897.

Michel, Rex R. *Historical Development of the Estimate of the Situation.* Research Report 1577. Fort Leavenworth: U.S. Army Research Institute for the Behavioral and Social Sciences, October 1990. NTIS, AD-A230 562.

Roberts, Nancy C. *New Directions for Military Decision Making Research in Combat and Operational Settings.* Monterey: Naval Postgraduate School, 1992.

Thordsen, Marvin, Joseph Galushka, Gary Klein, Saul Young, and Christopher Brezovic. *A Knowledge Elicitation Study of Military Planning.* Technical Report 876. Alexandria: U.S. Army Research Institute for the Behavioral and Social Sciences, 1990.

U.S. ARMY PUBLICATIONS

U.S. Army. *Battle Command Techniques and Procedures: A Commander's Guide for the Coordination and Employment of Battlefield Operating Systems*. Fort Leavenworth: U.S. Army Battle Command Battle Laboratory, 1995.

U.S. Army. *Field Manual 100-5, Operations.* Washington, D.C.: Department of the Army, 1993.

U.S. Army. *Field Manual 101-5, Staff Officer's Field Manual, Part I.* Washington, D.C.: U.S. War Department, 1932.

U.S. Army. *Field Manual 101-5, Staff Officer's Field Manual, Staff Organization and Procedures.* Washington, D.C.: Headquarters, Department of the Army, 1950.

U.S. Army. *Field Manual 101-5, Staff Officer's Field Manual, Staff Organization and Procedures.* Washington, D.C.: Headquarters, Department of the Army, 1960.

U.S. Army. *Field Manual 101-5, Staff Officer's Field Manual, Staff Organization and Procedures.* Washington, D.C.: Headquarters, Department of the Army, 1968.

U.S. Army. *Field Manual 101-5, Staff Officer's Field Manual, Staff Organization and Procedures.* Washington, D.C.: Headquarters, Department of the Army, 1972.

U.S. Army. *Field Manual 101-5, Staff Organization and Operations.* Washington, D.C.: Headquarters, Department of the Army, 1982.

U.S. Army. *Field Manual 101-5, Staff Organization and Operations.* Washington, D.C.: Headquarters, Department of the Army, 1984.

U.S. Army. *Field Manual 101-5, Staff Organization and Operations.* Washington, D.C.: Headquarters, Department of the Army, 1997.

U.S. Army. *Field Manual 3-0, Operations (DRAG Edition).* Washington, D.C.: Headquarters, Department of the Army, 2000.

U.S. Army. *U.S. Army CGSC Student Text 101-5*, *Staff Organization and Operations*, Fort Leavenworth: U.S. Army Command and General Staff College, 1994.

U.S. Army. *U.S. Army CGSC Student Text 101-5*, *Staff Organization and Operations*, Fort Leavenworth: U.S. Army Command and General Staff College, 1993.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1986.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1987.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1988.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1989.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1991.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1992.

U.S. Army. *U.S. Army CGSC Student Text 100-9*, *The Command Estimate*, Fort Leavenworth: U.S. Army Command and General Staff College, 1993.

INTERNET RESOURCES

Fallesen, John J. "Lessons Learned on Tactical Planning: Implications for Procedures and Training." A*rmy Research Institute Web Site,* http://www.ari.army.mil/lesslear.htm, Spring 1995.

Kolb, David A. "Management and the Learning Process." *University of Zaire Innerweb Site*, http://innerweb.und.ac.za/courses/oms/module1/how.htm, September 2000.

Holder, Leonard (LTG Ret.) *Situational Awareness in Infantry Battalions. Army Research Institute Web Site,* http://www.ari.army.mil/situationawareness.htm, 1998.