

**USING THE SAME DECISIONMAKING PROCESS FOR
JOINT AND ARMY OPERATIONS**

**A MONOGRAPH
BY
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Aviation**



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ABSTRACT

USING THE SAME DECISION MAKING PROCESS FOR JOINT AND ARMY OPERATIONS. by MAJ Kenneth R. Smith, USA, 42 pages.

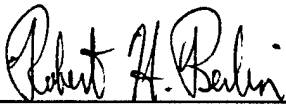
This monograph recommends that the U.S. Army adopts the operational planning process, found in Joint doctrine, for decision making at the division and corps level. The operational planning process is compared to the military decision making process. This comparison identifies tasks that are unique to the Joint operational planning process—determine center(s) of gravity and decisive points, conduct a force structure analysis, and determine an operational end state. The impact of introducing these new tasks is that the staff's decision making performance declines. The interaction of feedback and experience on decision making performance is examined. An analysis of the transition between the military decision making process to the operational planning process identifies the demand for the staff to develop experience in these new tasks. Lack of experience not only effects the staff's performance, but also degrades the ability of the chief of staff to improve the staff's performance through feedback. Since the analytical task of the military decision making process are mirrored in the operational planning process, the recommendation to change processes is made in order to satisfy the demands to develop experience.


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INTRODUCTION

It has become almost axiomatic in recent years that when the army fights, it will fight only as a part of a Joint force. Yet, in fighting as part of a Joint force, the U.S. Army maintains doctrinal decision making processes that differ in significant ways from their corresponding Joint processes. These differences can degrade the decision making processes when staffs, trained according to army doctrine, attempt to operate as a Joint headquarters and are unfamiliar with the location and flow of information within Joint staffs.

As the U.S. becomes more involved in peace operations, and other forms of operations other than war, the likelihood of an army division functioning as the joint task force (JTF) headquarters increases. If the division is not the JTF headquarters, elements of the division staff will most likely integrate into the JTF staff.

This paper argues that the U.S. Army's decision making process should be the same decision making processes found in Joint doctrine. Staff decision making is a collective task. As a collective task, it has conditions and standards describing how the staff executes the task. Joint doctrinal decision making processes focuses the staff's attention towards identifying center(s) of gravity and decisive points, conducting JTF force structure analysis, and defining the operational end state. The U.S. Army's military decision making process (MDMP) focuses the staff's attention towards the intelligence preparation of the battlefield and defeating the enemy's course of action. Changing the

structure of the decision making process, changes the task. Changing the task as the staff executes the operational planning process—which Joint doctrine prescribes—adds an unnecessary layer of complexity. The task is changing simultaneously with the augmentation of the staff from other services at the same time as the staff expands its scope of operations.

However, the argument should be based on more than a suggestion of a conflict with training doctrine, so the question becomes: At the corps and division level, should the U.S. Army adopt the decision making process found in Joint doctrine rather than maintain its own distinct process?

To answer the research question, three conditions must be met: (a) there must be a theoretical basis that demonstrates the importance of experience with the process in staff decision making; (b) the transition from the MDMP to the Joint process must require the staff to execute analytical tasks that are significantly different for which the staff has no experience; (c) Joint decision making processes should include the planning factors contained in the MDMP. To analyze these criteria, this monograph presents a literature/theoretical review, a comparison of Joint and Army doctrinal decision making processes, and analyzes the transition between the two processes.

There is a considerable amount of research showing that decision making processes are not truly representative of how decisions are made.¹ Decision making processes are formal strategies of where and how the staff focuses its attention during problem solving.² As the commander's decision increases in complexity, the commander seeks assistance from his staff. The information is divided along domains of expertise, the staff officers collect and analyze the information, and then they integrate their information and

make a recommendation to the commander. The commander makes his decision based upon an analysis of the simplified problem presented to him by his staff.

This monograph presents the evolution of a theory developed by John R. Hollenbeck and colleagues from Michigan State University, that models staff decision making and identifies core and non-core constructs within that model. Using this model, they show the interactions and impact of experience and feedback in staff decision making. With an understanding of how feedback interacts with experience during decision making, a theory describing feedback interventions, developed by Avraham N. Kluger, from The Hebrew University of Jerusalem, and Angelo DeNisi, from Rutgers University, is presented to show how feedback modifies behavior.

Since after action reviews (AARs) are an essential element of both Joint and U.S. Army training doctrine, feedback already plays an essential role during the training and professional development of staff officers. Understanding how feedback changes behavior is important. In order to improve the staff's performance, feedback presented during the AARs must be structured and presented correctly. Kluger and DeNisi's theory explains that structure.

Decision making processes from Joint and U.S. Army doctrine are then compared with each other to show that although they are both patterned after a rational choice model, they differ in significant areas. Specifically, they differ in the method of analyzing the situation. The U.S. Army's military decision making process uses the intelligence preparation of the battlefield (IPB) to determine the threat's likely courses of action (COAs) and describe the environment where friendly forces are operating.³ In operational planning process, the staff also determines the threat's likely courses of

action and describes the environment where friendly forces are operating. However, in operational planning process, the staff analyzes the situation to determine enemy and friendly center(s) of gravity and decisive points conduct a JTF force structure analysis, and also determines the operational end state.⁴ Army staffs, trained to execute the MDMP during planning, are not experienced in collectively conducting the further analysis prescribed in the joint process. When an Army division staff executes planning and decision making according joint doctrine, it has to learn these tasks at the same time it is expanding the scope of its planning considerations. This is a layer of complexity that can be reduced by training army staffs in these tasks when executing army operations.

This paper recommends that the decision making process found in both Joint and Army doctrine should be the same. This paper also recommends that the MDMP be adjusted to mirror the decision making process found in Joint doctrine.

The significance of this paper is that if recent history and experience continues, army staffs will become increasingly involved in Joint decision making especially when army units serve as the core of the JTF headquarters. As the division staff becomes the core of the JTF staff, it will become harder to execute and supervise the decision making process, if the staff is simultaneously having to learn the process for itself. Changing the process so that staffs, and individual staff officers, are already experienced in all the tasks of the decision making process will improve the staffs ability to assist the commander with his decision making.

CHAPTER 1

THEORY

James G. March, the Jack Steele Parker Professor of International management and professor of political science and sociology at Stanford University, explains that decision making processes are about the focus of attention or searching for information rather than about choice.⁵ Changing how a staff focuses its attention simultaneously with increasing the types and amount of available information (as the information from other services plays a more significant role than in U.S. Army operations), alters the decision making environment. Since the staff's role in decision making is to ensure that all relevant information is considered when formulating and recommending a course of action, individual staff members must decide what information, unique to their area of expertise, is relevant. They must also know when and how to present that information. Conversely, other staff members must be able to thoroughly process the new information into the staff's recommendation to the commander.⁶

Much of the research in decision making and judgment theory approaches decision making accuracy using different models and different techniques. The difficulty in these multiple approaches, as expressed by Kenneth R. Hammond (from the Center for Research on Judgment and Policy, University of Colorado) is that the interrelations between the findings of these different approaches are not yet fully understood.⁷ Indeed, there is a multitude of information describing the inadequacies and flaws in human

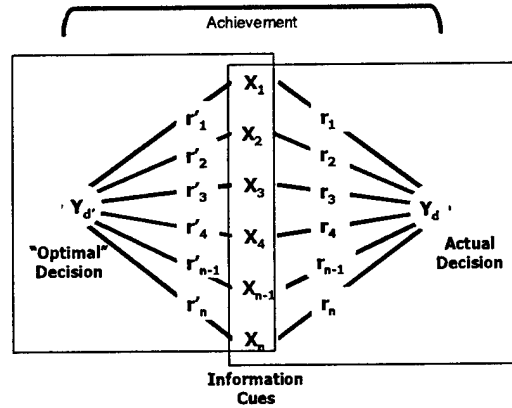
judgement and decision making.⁸ However, this paper presents the evolution of a theory on decision making in staffs recently proposed by John R. Hollenbeck and colleagues. This theory identifies constructs to describe and analyze decision making in staffs that enable the inclusion of other findings to show the importance that processes play during staff decision making. Hollenbeck, et al.'s theory identifies constructs that if managed properly can improve decision making accuracy.

Brunswick's Lens Model of Decision Making

Egon Brunswick, in the early 1950s created a model to describe decision making. According to Brunswick's model, the environment is filled with information. Information that is relevant to the decision being made is defined as an **information cue**. The amount of relevance an information cue has towards the decision, as compared to other information cues, is defined as its **weight**. There are two types of weight: the optimal weight and the actual weight. The **optimal weight** is a theoretical weight, and represents the ideal weight an information cue has in a perfect world where all the causal relationships are understood. The **actual weight** is the weight the decision maker gives to the information cue in the process of making a decision.⁹

The **optimal decision** is the decision based upon the optimal weighting of the information cues. The **actual decision** is the decision reached based upon the information cues, and their actual weight, considered by the decision maker in making a decision. How well the actual decision matches the optimal decision is defined as **achievement**. Achievement is increased when the actual decision approaches the optimal decision.¹⁰

Figure 1. Brunswick's Lens Model¹¹



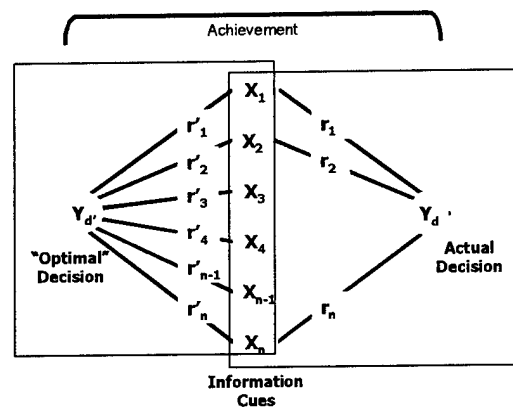
Legend: X_{1-n} represent information cues. r'_{1-n} represent the optimal weighting of the information cues. Y_d' represents the decision based upon the optimal weighting. r_{1-n} represent the actual weighting of the information cues by the decision maker. Y_d represents the actual decision made by the decision maker.

Figure 1 is a graphic representation of Brunswick's lens model. The model allows the researcher to design experiments and measure the subject's use of information during decision making. By comparing variations in achievement, the researcher can identify and measure the effects of different variables on decision making. Brunswick's model is based on an accepted theory that human decision making is based upon linear equations—specifically multiplication and addition.¹²

An example of Brunswick's model is that the commander needs to decide on a course of action to accomplish his mission. As he analyzes the situation using the factors of METT-T¹³, he gains information (some relevant and some irrelevant), from reconnaissance, reports, intuition etc. Based upon his training, education, and experience, he determines which information is relevant to accomplishing his mission. He considers certain information cues to be more relevant to the situation than are

others—the actual weight. His process of weighting information cues and making a decision (the actual decision) is depicted on the right side of figure 2. The theoretical concept of optimal weighting and reaching a decision based upon the optimal weighting of the information cues, is depicted on the left side of figure 2. Comparing the commander's actual decision with the optimal decision is the measure of the commander's decision making achievement.

Figure 2. Brunswick's Lens Model with Selective use of Information Cues¹⁴



Brunswick's model depicts the decision maker analyzing and weighting all the information cues available for the decision. However, in studying the decision making performance of experts, it has been observed that decision makers only consider a limited number of the available information cues when they make decisions.¹⁵ As the complexity of the decision increases, limiting the number of information cues analyzed when making a decision (figure 2) decreases the decision maker's achievement. To

ensure more information is analyzed, and a higher amount of achievement is maintained, the decision maker employs a staff of experts to assist with the decision.¹⁶ However, Brunswick's model is an individual decision making model, not a staff decision making model.

Brehmer and Hagafors's Paradigm for Staff Decision Making

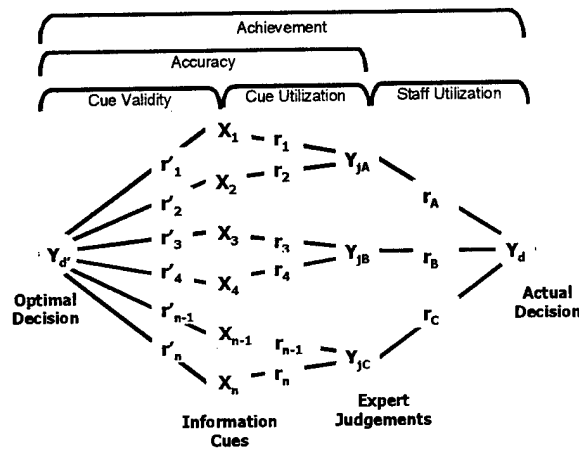
In 1986, two Swedish researchers, Berndt Brehmer and Roger Hagafors, extended Brunswick's research. Brehmer and Hagafors found that even though group decision making was a very active area of psychological research, there was little research relating to staff work and decision making in staffs. Staff work had no theory or pre-theoretical framework to guide researchers, so they developed their own paradigm to guide the study of decision making in staffs.¹⁷

Brehmer and Hagafors introduced several new terms as they adapted Brunswick's model to represent the different processes involved in staff decision making. **Cue validity** is the optimal weighting from Brunswick's model. **Cue utilization** is the actual weighting of the information cues by the staff member. Expert utilization is defined as the actual weight given by the decision maker to the judgment of each staff member. **Accuracy** is defined as the ability of the staff member to properly weight the relevancy of the information cues and is measured by comparing cue utilization with cue validity. The definition of achievement remains unchanged from Brunswick's model.¹⁸

Brehmer and Hagafors's paradigm is graphically represented in Figure 3. The information cues X_{1-n} are divided into domains of information and an expert analyzes the information cues in a domain which corresponds to his area of expertise. Based upon his analysis of the information cues, the expert presents to the decision maker a judgment.

The decision maker now bases his decision on the judgments, or recommendations, of all the experts. Essentially, the decision maker has reduced the amount of information he needs to analyze to a manageable amount.

Figure 3. Brehmer and Hagafors's Model for Staff Work¹⁹



Brehmer and Hagafors's paradigm served as an early model to study the decision makers dependency on the staff when making decisions. Specifically, they wanted to see the decision makers reaction when accuracy is degraded. They examined two specific causes, the first being low cue validity, and the second being low cue utilization caused by low competency on the part of the staff member.²⁰

In both cases of low accuracy, decision makers show a strong dependency on the staff members' judgment. In both conditions, there was a small but insufficient decrease in the weighting of the staff members' judgment by the decision maker. By not decreasing the weighting sufficiently, the decision maker effectively over-weights an

inaccurate judgment. In the case of poor cue utilization, it is interesting to note that the decision maker did not analyze the information cues himself.²¹

Continuing the example presented earlier, in order to include more information than he was able to analyze himself, the commander divides the information cues along domains of knowledge. He then assigns a staff officer responsibility for collecting and analyzing the information cues relevant to the commanders decision that are within the staff officers area of expertise. The staff officer then makes a recommendation to the commander of how his information relates to the commander's decision. The commander analyzes the recommendations from each of the staff officers and weights them according to how he perceives their relevancy to his decision and then makes his decision.

According to Brehmer and Hagafors's findings, commanders are able to recognize decreased accuracy in staff officer's recommendations, and while they may reduce their weighting of inaccurate recommendations, they do not adjust the weighting enough as they make the actual decision. But, one of the limitations of Brehmer and Hagafors's paradigm is that it does not consider the social context—the interaction and interrelationship between people—of staff decision making. This paradigm models staff decision making under conditions similar to a commander receiving written recommendations from the staff officers, then incorporating those recommendations into his decision with no face-to-face contact with the staff officers. In spite of the theory's limitations, the paradigm proposed by Brehmer and Hagafors served its purpose as a pre-theoretical framework to guide further research in staff decision making.²²

Hollenbeck, et al.'s Multilevel Theory for Decision Making in Hierarchical Teams

In 1995, John R. Hollenbeck, and others, from the Department of Management, Eli Broad Graduate School of Business, Michigan State University developed a theory to describe decision making in hierarchical teams. **Hierarchical teams** are decision making teams composed of individuals who differ in areas of specialization and status. Members of hierarchical teams have a common goal, depend on each other for information related to the team's success, and influence each other during decision making. An essential distinction between hierarchical teams and other decision making groups is that hierarchical teams do not vote nor do they have to reach a consensus; the leader of the team makes the decision for the team.²³

Hollenbeck, et al. recognized the effects social interactions have on information flow between people. They included those social interactions as well as the cognitive activities already modeled in Brehmer and Hagafors's paradigm. As they expanded the model, they identify constructs to describe the various activities and conditions occurring during decision making. They identify core and non-core constructs in their theory.

Core constructs are those constructs that have a causal relationship to each other. The relationship affects decision making accuracy. An increase or decrease in any of the core constructs has a corresponding effect in a subsequent core construct, and ultimately decision making achievement. Core constructs mediate the effects of non-core constructs.²⁴

Non-core constructs are variables and activities that affect decision making achievement by affecting one of the core constructs. The effect on decision making achievement is based upon its effect on the core construct.²⁵

Hollenbeck, et al. developed their theory under the premise that better informed teams make better decisions. Their theory states that decision making achievement is determined by constructs that occur at one of four levels: the decision-level, the individual-level, the dyadic-level, and the team-level.²⁶

The lower level constructs occur at the decision, individual, and dyadic-levels. At the **decision-level**, the decision object itself generates a set of information cues. The actions of the individual staff members as they acquire, analyze, weight, and make recommendations based upon these information cues constitute the **individual-level**. The interaction between the leader and the staff member constitutes the **dyadic-level**. This interaction is affected by a multitude of social factors (social standing within the hierarchy, personality, perceived confidence, etc.) and affects how the decision maker weights that staff member's recommendations.²⁷

The lower level constructs are decision informity, individual validity, and dyadic sensitivity. **Decision informity**, which occurs at the decision-level, is the extent to which an individual has the information cues pertaining to the decision. **Individuality validity**, which occurs at the individual-level, is the extent that an individual's judgements are predictive of the true state of the decision object. **Dyadic sensitivity**, which occurs at the dyadic-level, is the extent to which the team leader correctly weights the recommendation of an individual staff member.²⁸

They identify three core constructs at the team-level that are central to decision making accuracy in hierarchical teams. The three team-level core constructs are: **team informity**—the degree to which the team is apprised of all the information cues associated with the decision; **staff validity**—the degree to which the team integrates the

judgements of its lower level members into a recommendation that is predictive of the decision object; **hierarchical sensitivity**—the degree that the team leader effectively weights the judgements of the staff when making the team's decision. According to their theory, management of decision making processes, within the framework of these constructs, is the key to improving staff decision making.²⁹

Each team-level core construct is an aggregation of a corresponding lower level, core construct. Team informity is an aggregation of decision informity, and represents the degree to which the team has integrated the information cues from each staff member's area of expertise.³⁰

Staff validity is the aggregation of individual validity. It represents the degree to which the staff has integrated each staff member's recommendations into the overall recommendation.³¹

Hierarchical sensitivity is the aggregation of dyadic sensitivity. It represents the ability of the leader to properly assess and weight the recommendations of the individual staff members into the decision he makes for the team.³²

According to Hollenbeck and his colleagues, the decision making environment is filled with data and information. The individual staff member identifies in the environment the relevant information within his area of expertise (information cues). The extent to which the staff member has identified all of the information cues from the environment is decision informity. Informed, the staff member now considers and weights all of these information cues into his predictive judgment. This occurs at the individual-level. The extent to which the staff member's predictive judgment is representative of the future event is the core construct of individual validity. At the

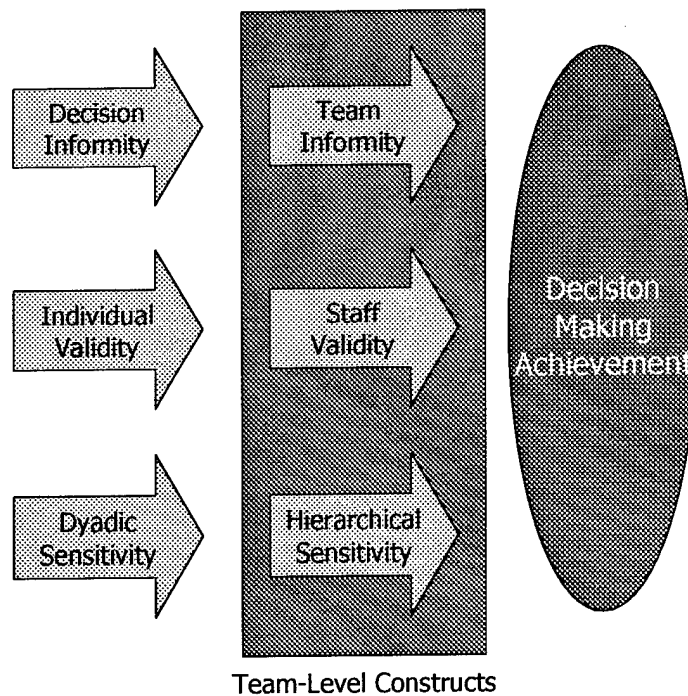
dyadic-level, the staff member and the team leader interact as the staff member presents his judgments to the team leader. The social construct of this interaction influences how the decision maker perceives the staff member's recommendation. The extent to which the decision maker accurately weights the recommendation of the staff member is referred to as dyadic sensitivity.³³

Each staff member achieves a degree of decision informity, but at that point, the information cues are still separated along domains of expertise. Ensuring that all the staff members have some degree of decision informity and understanding the current interactions of the information cues across domains of expertise is team informity. The extent to which the entire staff can integrate the information cues is the measure of team informity.³⁴

Likewise, each staff member achieves a degree of individual validity associated with his or her predictive judgments. Like decision informity, these predictive judgments are also separated along areas of expertise. Staff validity is the extent to which these individual recommendations are integrated into staff recommendations, which account for the interactions across areas of expertise. The social context of the leader's interaction with each individual staff member (dyadic sensitivity) is also integrated across the entire staff and is referred to as hierarchical sensitivity.

There are causal relationships between the lower level core construct, its corresponding team-level core construct, and decision making achievement. Figure 4 is a graphic representation of this relationship.

Figure 4 Hollenbeck, et al.'s Core Constructs for Staff Decision Making



The influence of a non-core construct and decision making achievement can be explained in terms of its effects upon the core constructs—mediation. Researchers are able to show that the influence on decision making achievement correlated to the increase or decrease of the affected core construct(s) by standardizing the increases in the core construct and decision making achievement. This ability to standardize the effects and determine their source allows the researcher to better understand the effects of non-core constructs on decision making achievement.³⁵

Increasing individual informity causes an increase in team informity, and subsequently a corresponding increase in overall achievement. The same chain of relationships also exists for the other core constructs. Having developed their theory, Hollenbeck, and his colleagues, began to examine the relationship of various non-core constructs on decision making. Specifically, they examined the effects of process feedback and experience on decision making achievement.

The Effects of Feedback and Experience Using the Multilevel Theory for Decision Making in Hierarchical Teams

In 1998 Hollenbeck and his colleagues expanded their theory and their model to test the effects of experience and feedback as they pertain to staff decision making. The hypotheses that they set about to test are depicted in table 1.

Table 1. Hollenbeck et al.'s Experimental Hypotheses³⁶

1A	Teams provided with process feedback on the core constructs of the multilevel theory of team decision making will perform better than teams that are only provided outcome feedback.
1B	The effect of process feedback on team performance will be mediated by the core constructs specified by the multilevel theory of team decision making.
2A	Experienced teams will perform better than inexperienced teams.
2B	The effect of experience on team performance will be mediated by the three core constructs specified by the multilevel theory of team decision making.
2C	The relationship between experience and positive team outcomes (such as decision accuracy and the core constructs) will be stronger in the absence of process feedback, which acts as a substitute for experience.
3A	There will be a positive relationship between team informity and staff validity.
3B	There will be a negative relationship between staff validity and hierarchical sensitivity.
3C	The relationship between team informity and staff validity will be stronger in the presence of process feedback.
3D	The relationship between staff validity and hierarchical sensitivity will be enhanced by experience.

They found all the hypotheses to be true except for hypothesis number 2C. Feedback is effective in helping both experienced and inexperienced teams improve their performance. As they examined the impact of feedback and experience on decision making achievement, they also identified parallel relationships among the team-level core constructs. Specifically, increased team informity corresponds to increased staff validity. This impact is enhanced even further in the presence of process feedback. In other words, better informed staffs make better recommendations, and the improvement of those recommendations is magnified in the presence of process feedback. This lateral

relationship between constructs was not identified when they developed their initial theory.³⁷

Additionally, they identified the relationship between staff validity and hierarchical sensitivity. When staff validity is high, hierarchical sensitivity is also high. Conversely, when staff validity is low, there is a decrease in hierarchical sensitivity. This corresponds to the findings by Brehmer and Hagafors that when experts' recommendations become less valid, it becomes increasingly more difficult for the decision maker to properly weight their recommendations. Hollenbeck and his colleagues also found that staff validity is primarily affected by experience. Staff validity is further enhanced in the presence of feedback.³⁸

Well informed staffs will make better recommendations—higher staff validity. The commander is better able to weight staff recommendations when the staff has a high level of staff validity. If the staff's actions are being supervised and controlled by the chief of staff, he can affect this process by providing process feedback to the staff. This process feedback will help the staff increase the validity of their recommendations. If the staff is already sharing a high level of experience in the decision making process, this will further enhance the staff's validity and the commanders ability to correctly weight the inputs and recommendations of the various staff members.

Additionally, any staff, regardless of the degree of experience it enjoys will benefit from process feedback. Feedback and experience interact to improve decision making achievement. Therefore, it is important to understand how feedback works and how it is associated with experience.

Feedback Theory and Its Applicability to Training

In 1996, Avraham N. Kluger, from the School of Business Administration, The Hebrew University of Jerusalem, and Angelo DeNisi, from the School of Management and Labor Relations, Rutgers University, published a historical review of feedback intervention research. They also provided a preliminary, feedback intervention theory along with their review.³⁹

Their feedback intervention theory has five components. (a) Comparing feedback to performance goals or standards regulates behavior. (b) Goals or standards are organized hierarchically. (c) Attention is limited, therefore only feedback-standard gaps that receive attention, by the recipient, actively participate in behavior modification. (d) Attention is normally directed to a moderate level of the hierarchy. (e) Feedback interventions, that identify a feedback-standard gap, change the focus of attention and subsequently behavior. These five components of their feedback intervention theory are interrelated and are built around three essential concepts: a feedback-standard gap, a feedback hierarchy, and attention.⁴⁰

Feedback-standard gaps exist when feedback on task performance differs from the standard or goal set for that task.⁴¹ If the standard is higher than the performance, the gap is negative, and if the performance is higher than the standard, then the gap is positive. Individuals react to feedback standard gaps with one of four coping mechanisms. Two of the coping strategies involve changing one of the reasons for the gap—changing performance to meet the goal, or changing the goal to meet the performance. The other two mechanisms involve the elimination of the reasons for the gap—reject the feedback intervention, or abandon the goal.⁴²

Kluger and DeNisi recognized that feedback-standard gap comparisons were too simplistic to stand alone as a theory, so they added to their theory the concept of hierarchies of feedback intervention. The hierarchies referred to have three levels of linked processes which regulate performance: the meta-task processes involving self, the task-motivation processes involving the task, and the task learning processes involving the details of the task.⁴³

Kluger and DeNisi's theory recognizes the constraints on attention by noting that only those feedback-standard gaps that receive attention result in behavior modification. Identifying feedback-standard gaps causes the recipient of the feedback to shift the focus of his attention to one of the hierarchical levels. Their second proposition addresses the subsequent effects when the focus is shifted to the task-motivation or task-learning levels of the hierarchy.

“Feedback interventions effects on performance are augmented by (a) cues that direct attention to task-motivation processes and (b) cues that direct attention to task-learning processes coupled with information regarding erroneous hypotheses.”⁴⁴

Feedback should be focussed at either the task-motivation or the task-learning level in the hierarchy. If the feedback intervention is directed at the task-learning level, it also needs to include information that helps the recipient reject erroneous hypotheses for task learning or task design.⁴⁵

The Chief of Staff needs to be able to identify elements of the decision making process being executed poorly or that lack information. His observations should be directed at the task motivation level, (meaning that the staff officer already understands how to execute the task, and just needs to refocus or reorient his efforts in line with the guidance received from the chief of staff). If the reason for the deficiency is one of

experience, or not knowing how to execute the process correctly, the chief of staff needs to identify the problem and provide instructions as to how to execute the task. If the chief of staff identifies a problem but does not provide task learning information to the inexperienced staff officer, the staff officer will develop his own strategy to correct the deficiency; however, his new approach to the task may also be erroneous. Therefore, his increased efforts may or may not improve his performance on the staff.

This technique of providing feedback is captured in both Army and Joint Training Doctrine in the After Action Review (AAR) process. One of the key features in conducting AARs in a training environment is ensuring that the trainer has the appropriate levels of experience and expertise to provide this type of experience.⁴⁶ If the staff is inexperienced, then the feedback requires increased amounts of task learning instructions which makes the process ineffective and degrades overall decision making achievement until the staff develops the requisite level of experience.⁴⁷

Summary

In other words, staffs high in team informity show increased achievement as compared to staffs with low team informity. This same relationship exists between staff validity and achievement as well as for hierarchical sensitivity and achievement.

Teams with high staff validity also demonstrate high levels of hierarchical sensitivity. The converse is also true—teams with low staff validity demonstrate low levels of hierarchical sensitivity. If the staff makes valid recommendations to the commander, he is able to make better decisions. If the staff makes poor recommendations to the commander, the quality of the commander's decisions also

decreases, even though he can reject the staff's recommendations and make his own decision independently.

Experience has a direct impact upon staff validity. Experienced staff members make better recommendations to the decision maker and thus increase staff validity causing a corresponding increase in hierarchical sensitivity.

The effects of experience on staff validity is further enhanced in the presence of process feedback. This effect is caused by the feedback being directed at the task-motivation level which causes the staff member to increase his or her efforts towards reducing the feedback-standard gap.

Feedback helps in the development of experience. When process feedback is directed at the task-motivation level of the recipient's hierarchy, it initially causes a response at the task-learning level. The person providing the feedback prevents the recipient from pursuing erroneous techniques to improve performance by providing information on how to execute the task correctly. Joint and Army training doctrine already captures the essence of this concept of feedback in the concept of an AAR.

When faced with a new decision, decision informity decreases until the staff member acquires the new information cues. To regain a high level of decision informity, the staff member must be presented with feedback that: (a) motivates the staff member to increase his or her efforts to find the information cues; (b) provides task learning information describing where to find the relevant information.

Changing the conceptual structure of the decision causes a decrease in individual and staff validity. The decrease is caused by either: (a) increasing the amount of information cues that are weighted into the recommendation; (b) changes to the structure of the

recommendation causing different concepts to be analyzed and considered in the recommendation. To regain a high level of individual and staff validity, the staff needs to gain experience in making recommendations under these new conditions. Feedback plays an important role as the staff develops this experience. Properly given feedback teaches the staff how to make the recommendations under these new conditions, and ensures that the staff develops experience making valid recommendations.

The strong, almost causal relationship that exists between staff validity and hierarchical sensitivity means that until the staff reaches a high level of validity, the commander's hierarchical sensitivity—the ability to properly weight the recommendations of the staff—is degraded.

CHAPTER 2

JOINT AND ARMY DECISION MAKING PROCESSES

Battlefield visualization is an essential component of the concept of battle command. The commander must be able to visualize his current state, a desired end state, and the steps he and his unit must take to achieve the desired end state.⁴⁸ To reduce the complexity of the battlefield environment, the staff assists the commander as he develops his battlefield visualization. As stated earlier, staffs use formal decision making processes to collectively focus their attention.

The process used is important because it provides the staff a framework within which to: (a) develop a common understanding of the problem; (b) analyze the problem from the perspective of their area of expertise; (c) present the results of their analysis to the commander in the form of a recommendation. Most decision making processes use a rational choice model of analyzing a situation, developing courses of action, and selecting the best course of action.⁴⁹

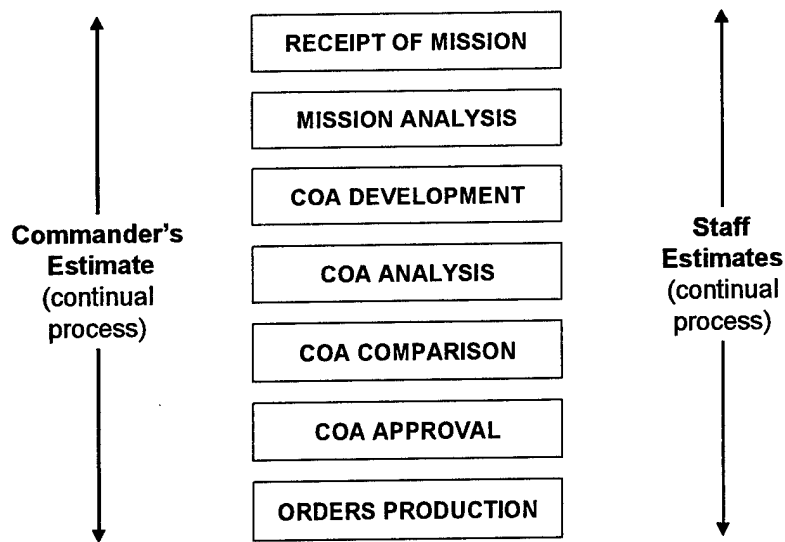
The structure of a decision making process represents a balance between the expenditure of resources and the benefit of the decision. The expended resource is time in a military staff. The benefit of the decision is a recommended course of action (COA) that allows the commander to achieve his desired end state. The recommendation from the staff may not be a perfect solution, but it is sufficient to allow the commander to augment it with his judgement and experience and accomplish his mission.⁵⁰

The decision making processes for both the Army's military decision making process (MDMP) and the Joint Operational Planning Process maintain this same rational choice structure. The differences between the two processes are the analytical concepts used—specifically, the operational planning processes use of center(s) of gravity and decisive points, JTF force structure analysis, and end state.

MDMP

Figure 5 depicts the basic structure of the Army's MDMP. It is a sequential process with defined steps. Mission analysis contains seventeen steps. It focuses on intelligence preparation of the battlefield, identification of specified, implied and essential tasks, reviewing available assets, and determining critical facts and assumptions. From the mission analysis step comes a determination of initial reconnaissance requirements, the identification of the commander's critical information requirements, a restated mission, and a warning order.

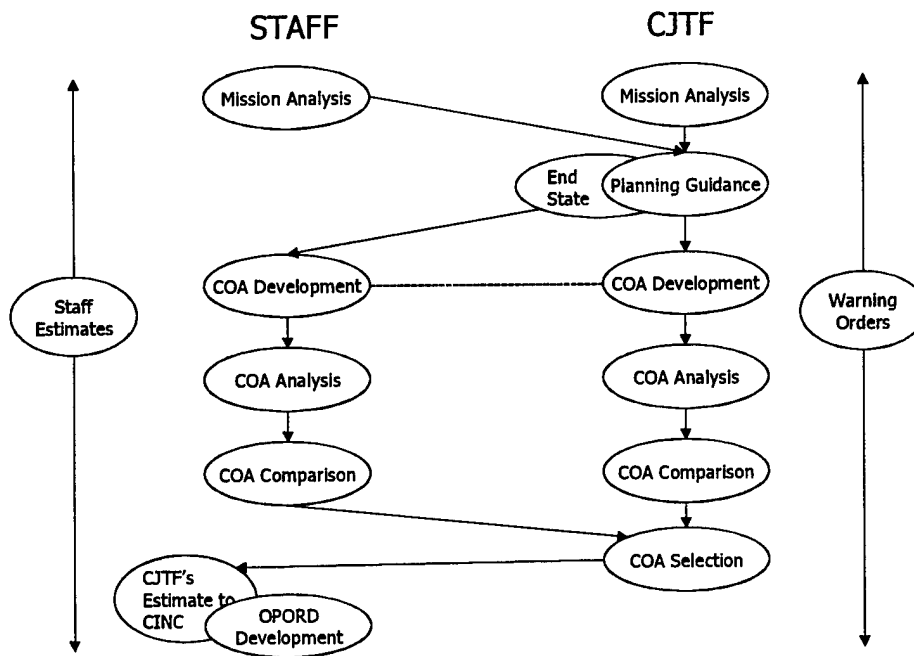
Figure 5. The Military Decision Making Process (MDMP)⁵¹



Operational Planning Process

The operational planning process also maintains a rational choice model in its approach to decision making, and the process is similar to the MDMP (figure 6). However, examining the subordinate steps of mission analysis highlights some important conceptual differences. The operational planning process determines known facts, develops assumptions, analyzes a higher commander's decision, and determines limitations just as the MDMP does.

Figure 6. Operational Planning Process.⁵²



The key differences are that the Joint process focussed attention at identifying enemy and friendly center(s) of gravity and decisive points, conducting a JTF force structure analysis, and defining the desired end state. Figure 7 compares the components of mission analysis to highlight the similarities and differences between these two processes.

Figure 7. Comparison of Mission Analysis Between Military Decision Making Process and the Operational Planning Process.⁵³

Military Decision Making Process	Operational Planning Process
Analyze the higher headquarters's order.	Determine known facts.
Conduct initial IPB.	Conduct Intelligence Preparation of the Battlespace.
Determine specified, implied, and essential tasks	Forces available, readiness status of JTF structure.
Review Available assets.	Time analysis.
Determine constraints.	Develop assumptions to replace missing or known facts.
Identify critical facts and assumptions.	Analyze CINC's mission and intent.
Conduct risk assessment.	Determine limitations.
+ Determine initial CCIR.	• Determine enemy and own center(s) of gravity (COG/decisive points).
Determine the initial reconnaissance annex.	Identify the task to be performed.
Plan use of available time.	• Conduct initial JTF Force Structure Analysis.
Write the restated mission.	Conduct an initial risk assessment.
Conduct a mission analysis briefing.	• Determine end state (conditions that define success/termination of operations).
Approve the restated mission.	Develop mission statement.
Develop the initial commander's intent.	Prepare mission analysis brief.
Issue the commander's guidance.	
Issue a warning order.	
Review facts and assumptions.	

- + CCIR are issued during the operational planning process as a part of the commander's planning guidance.
- Indicates concepts not contained in the military decision making process.

Making the Transition

Joint doctrine is prescriptive. Therefore, when an army division or corps transitions to becoming a JTF headquarters, it is required to execute planning processes in accordance with joint doctrine.⁵⁴

The use of joint doctrine and joint decision making processes help the staff shift its focus from primarily a tactical level to the operational level. According to Shimon Naveh, there exists a cognitive tension between the tactical and operational levels. The operational level commander is responsible to ensure that the objectives pursued by the tactical commander lead towards accomplishing the strategic objectives. The tension results from the tactical commanders focus at accomplishing his assigned mission. Without clear guidance and direction, in the form of a clearly defined operational end state, the accomplishment of the tactical mission can take upon itself a life of its own.

When this happens, the expenditure of resources is wasted, pursuing objectives that do not lead to successful accomplishment of the JTF's mission.⁵⁵

Many of the tasks contained within MDMP are merely expanded in scope as the division headquarters begins functioning as an operational headquarters and uses the operational planning process. Intelligence preparation of the battlefield expands into intelligence preparation of the battle space. The enemy is viewed and analyzed as a joint or multi-national enemy rather than an opposing ground force. Both processes determine constraints or limitations. Both processes conduct risk assessment.

In the MDMP, available assets are reviewed to determine their status, capabilities, and current disposition. In the operational planning process, the review of forces available expands to include all joint forces assigned to the JTF as well as any multi-national forces which are assigned.⁵⁶

The structure of the recommendations made by the staff to the commander is also nearly identical to that made during the MDMP. Validity of the staff should not decrease. The staff maintains the level of experience that it achieved while using the MDMP.

Because the commander is already experienced and familiar with the structure of these recommendations, and because the staff's validity should maintain itself relatively constant, the commander's performance at properly weighting the staff's recommendations should also remain constant.

However, there are three analytical tools used in the operational planning process that are not contained in the MDMP: (a) determine enemy and own center(s) of gravity

and decisive points; (b) conduct initial JTF force structure analysis; (c) determine end state.

The analysis required by the Joint process to determine enemy and friendly center(s) of gravity and decisive points is absent from the Army's MDMP. Although Army doctrine explains these concepts, they do not appear in the MDMP. At the operational level the determination of operational center(s) of gravity becomes important in order to attack the foundation of the enemies capability. Joint doctrine defines center(s) of gravity: "Those characteristics, capabilities, or locations from which a military force derives its freedom of action, physical strength, or will to fight." Joint doctrine also highlights: "That the destruction or neutralization of enemy center(s) of gravity is the most direct path to victory."⁵⁷

The IPB process helps the commander understand the battlefield and the options it presents to both enemy and friendly forces. The difference in analysis between using center(s) of gravity as an analytical tool and that which is already contained in the IPB process is that IPB focuses its attention on courses of action available to both the enemy and friendly forces. Concerning the enemy, the commander is able to focus his efforts at defeating the enemy's most probable course of action, while protecting himself from the enemy's most dangerous course of action. It could be said that IPB helps the commander defeat the enemy's course of action whereas, center(s) of gravity analysis helps the commander understand how to defeat the enemy while protecting his own forces.

Decisive points help the commander identify geographic locations that are keys to attacking enemy center(s) of gravity, especially protected center(s) of gravity that cannot be attacked directly. Not only does the analysis of decisive points help the commander

attack the enemy center(s) of gravity, but also identifies what geographic locations he must defend in order to protect his own center(s) of gravity.⁵⁸

The analysis of center(s) of gravity and decisive points contained in the operational planning process does not have an equivalent analysis within the MDMP. Therefore, the staff needs to: (a) identify the information relevant to this analysis; (b) learn how to conduct this analysis.

The determination of center(s) of gravity and decisive points is not the only difference between the MDMP and the operational planning process. The operational planning process also requires JTF commander and staff to conduct a JTF force structure analysis in order to determine the force structure necessary to accomplish the essential task. The JTF staff determines any forces or capabilities that are necessary to achieve the strategic objectives. The JTF staff identifies these requirements to the organizing authority.

This analysis differs from the analysis used for the task "review available forces" because it identifies requirements for capabilities not present in the JTF rather than merely seeking the best application of assigned forces. Once again the tension between the operational level and the tactical level exerts its influence on this task. Resolving this tension and ensuring the overall effort is focused towards obtaining the strategic objectives is the responsibility of the JTF commander. This task requires the staff to understand the various factors involved in this tension and requires them to weight those factors correctly.⁵⁹

The third analytical concept used in the joint operational planning process is the definition of the operational end state. In the MDMP, the description of the desired end

state comes from the commander's intent. In the operational planning process the end state describes those conditions that must be met in order to: (a) end armed conflict, (b) prevent the enemy from being able to renew the conflict, (c) support the population of a previously hostile government, (d) describes conditions in terms of continuing friendly force capabilities.⁶⁰ Many of these conditions are actually driven by the desire of the national command authorities and are imposed on the commander of the JTF.⁶¹

Unlike the end state developed by the tactical commander, operational end state considers more than military aspects. Because strategic objectives are normally not defined in military terms, the JTF commander and staff must be able to define an operational end state in military terms. Sometimes there is a need to describe a preliminary end state—the military end state—as well as a broader set of end state conditions which may include other instruments of national power. This translation of strategic objectives into military terms is significantly different than the definition of an end state at the tactical level and requires the staff to develop experience in order to make valid recommendations.

Summary

All of the aspects of the MDMP in mission analysis are contained in the operational planning process. As the division or corps headquarters transitions from the MDMP to the operational planning process, the analytical tasks resident in the MDMP merely expand in scope.

However, the operational planning process has three analytical concepts not found in the MDMP. The structure of these tasks is significantly different. This difference requires the staff to identify what information is relevant to these tasks and how to

conduct the analysis required by these tasks. Chapter Three is an analysis of the impact of these changes using the theories presented in Chapter One.

CHAPTER 3

ANALYSIS AND RECOMMENDATION

This chapter analyses the impact of transition from the MDMP to the joint planning process using theories presented in Chapter One. The analysis consists of examining the impact of the transition along each of the core constructs. Three areas will be analyzed: (a) analytical tasks that differ only in scope; (b) analytical tasks introduced by the transition to the joint operational planning process—specifically the determination of center(s) of gravity and decisive points, JTF force structure analysis, and the determination of the operational end state; (c) the availability of adequate feedback.

Each area is analyzed in the following manner: (a) identification of adverse effects caused by the transition; (b) description of the effects in relation to the core constructs of Hollenbeck's theory; (c) determination from theory whether the effects are correctable through experience or feedback. If the results of the analyses indicate that the effect is correctable through feedback, then the recommendation to change processes cannot be made based upon this analysis. If the results of the analysis indicate that the effect is correctable through experience, then the recommendation can be made to change the process.

Recall from Chapter One that decision making achievement can be described by influences on the core constructs. The core constructs influence decision making achievement along three parallel paths: informity (having sufficient relevant information

to make the decision), validity (the ability of the staff to make predictive judgments of future events), and sensitivity (the ability of the commander to correctly weight the recommendations from the various staff members).

Also, recall that at the team level, the core constructs have an influence on each other. Having sufficient relevant information increases the staff's ability to make valid recommendations. This effect improves in the presence of process feedback. Additionally, the ability of the staff to make valid recommendations to the commander effects the commander's ability to make correct decisions. If the staff's recommendations are less valid, the commander has difficulty correctly weighting their recommendations.

Analysis of Tasks that Differ in Scope

Many of the analytical tasks in the MDMP were shown to be reflected in the operational planning process (e.g. intelligence preparation of the battlefield, and intelligence preparation of the battle space, review of available assets, determination of known facts and assumptions, initial risk assessment, etc.). Chapter Two described the effects in these areas as being the expansion of the amount of information that is relevant to the decision. However, the analytical concepts being used remain the same, and the product of analysis, in each of these areas, does not change for the staff. The impact on the commander is that the expansion of the scope in these processes causes him to consider more recommendations in his decision.

The increase in relevant information necessary for the decision initially causes a decrease in decision, and consequently team, informity. The Army headquarters functioning as a JTF headquarters needs to expand its information gathering so that the

joint aspects of its mission are included. The cumulative effect of individual staff members not having enough relevant information for the decision results in a reduction in team informity.

The validity of the staff is reduced only because the information necessary to make a valid recommendation is absent. The nature and conceptual basis for recommendations in these tasks remains unchanged across the transition. Since the structure of the recommendation remains unchanged, the experience level likewise remains unchanged.

The commander's ability to correctly weight the recommendations of the staff remains low so long as the staff's recommendations are less valid. Additionally, the commander needs to adjust his weighting due to the increased number of recommendations presented in a joint versus an army decision making environment.

According to Hollenbeck's theory, process feedback has the greatest impact on informity. Feedback directed at the task motivation level helps the staff increase their efforts to obtain the information. Since the nature of the information remains unchanged and experiences only an increase in quantity, the feedback should not elicit a task learning response from the staff. The decrease in validity was due to the decrease in team informity. As the staff becomes better informed, the validity of their recommendations returns to its previous level.

The commander's ability to make an accurate decision, increases as the validity of the staff's recommendations increase. The impact of adjusting his sensitivity to consider the increased number of recommendations is overcome through feedback. Recall that hierarchical sensitivity is affected by feedback, not by experience.

Based upon this analysis, the effects of transitioning from MDMP to the operational planning process on tasks that differ only in scope can be corrected by providing feedback. The experience level in the process is not adversely affected. The decrease to decision making accuracy can be corrected by motivating the staff to increase its efforts at becoming informed and by providing the commander feedback to help him readjust how he weights the new recommendations he is presented with.

Analysis of Tasks Specific to the Operational Planning Process

The use of center(s) of gravity and decisive points as an analytical task is found in the operational planning process, but not in the MDMP. As stated earlier, in order to execute this task, the staff needs to identify relevant information and learn how to analyze that information in order to determine center(s) of gravity and decisive points. The staff needs to understand the interrelationships between these new information cues and how they work to provide the enemy “the hub of all power”. Not only is this a new task, but it must also be executed at the operational level.

Additionally, when the Army staff transitions from the MDMP to the operational planning process, it must also identify friendly center(s) of gravity at the operational level. It should determine what characteristics provide the JTF with its “hub of all power”.

Not only does the staff need to identify friendly and enemy center(s) of gravity, but they also need to analyze those center(s) of gravity to identify geographic locations that must be protected in order to protect the friendly center(s) of gravity. Likewise, the staff needs to identify those geographic locations that when attacked give the JTF advantage

with respect to the enemy center(s) of gravity. This determination of decisive points is also a task for which the staff needs to develop analytical processes.

Determining center(s) of gravity and decisive points adversely affects decision making achievement from two perspectives. The staff (both individually and collectively) is less informed about the decision until it learns where to find relevant information for this task. The staff needs to learn how to evaluate this information and identify the center(s) of gravity and decisive points. This is a new task, and the staff must develop a means to analyze this information and gain experience executing this task.

Hierarchical sensitivity also declines due to the decrease in staff validity. The reduction in this core construct is attributable to two issues: decreased validity because the staff is less informed, and decreased validity because the staff is not experienced in the correct way to analyze the information and make recommendations in this area.

Just as with those tasks that only differ in scope, feedback would have its greatest impact on the ability of the staff to gain information relevant to the decision. However, there is another aspect of the decline in decision making achievement caused by the transition between processes. A greater dilemma is the validity of the staff and their inexperience in analyzing these concepts.

Because the staff is not experienced in analyzing these concepts, they will make mistakes as they simultaneously develop processes and execute them. Their validity will remain low until they develop the correct process and become experienced executing that process. During this learning process, feedback needs to contain task learning instructions to prevent the staff from pursuing bad processes. Once the staff has correct processes established, then the feedback shifts to task motivation. If the task learning

information is not included early during this developmental process, the staff will continue to keep a low level of validity until it discovers this information for itself.

Until the staff's validity increases, the commander is ineffective at properly weighting the staff's recommendations. He understands that their recommendations are poor, but he does not have a means to compensate for their lack of validity. Once the staff begins making valid recommendations, feedback will help the commander improve in this area.

Recall that experience affects staff validity. Once the staff identifies the correct way to analyze these concepts it needs to gain experience in order to improve its performance and increase the validity of its recommendations to the commander. Feedback can accelerate this learning process by identifying the correct way to conduct this analysis, however the staff still requires time to gain experience.

These same effects (as described when the staff begins to determine center(s) of gravity and decisive points) will be repeated for the two other new tasks—conduct JTF force structure analysis, and determine operational end state. The decline in decision making performance is felt until the staff learns this new process and develops experience.

Analysis of the Availability of Adequate Feedback

The previous two sections share one aspect. They both depend upon feedback. The need to motivate the staff to find relevant information is constant in both situations. When the staff needs to learn new analytical tasks the feedback also needs to contain task learning information. The ability of the leader of the staff (either the commander or the chief of staff) to provide task learning information is important. If the feedback cannot

provide task learning information then the adverse effects are felt until the staff acquires this information on its own.

Assuming the chief of staff is the one who provides the feedback, he must be able to recognize when the staff, either individually or collectively, is executing erroneous processes and provide this task learning information. This infers that the chief of staff requires a certain amount of experience and mastery of the process in order to provide the quality of feedback necessary. If the chief of staff lacks this experience, his feedback is less effective at modifying the staff's behavior and performance because he is learning the task simultaneously with the rest of the staff.

Transitioning from the MDMP to the operational planning process introduces to the chief of staff the three conceptually different tasks previously discussed. If the chief of staff's professional development has gained him experience with the operational planning process, then he is better prepared to provide effective feedback. However, if he has not gained experience with the operational planning process, then he must learn these tasks before he can provide effective feedback.

Summary of Analysis and Recommendation

The effects caused by transitioning from the MDMP to the operational planning process have been analyzed against Hollenbeck's theory in this chapter. Some analytical tasks require an expansion in scope while maintaining their same conceptual structure (e.g. review available assets, determine facts and assumptions, etc.). Since the analysis remains unchanged, the challenge facing the staff is to collect sufficient information to make a recommendation. Feedback at the task motivation level helps the staff increase their efforts in collecting this information.

The three tasks introduced to the staff by the operational planning process require the staff to develop experience in order to make valid recommendations. While it is true that these tasks will also depend initially on feedback, the development of experience will be the greater obstacle for the staff to overcome.

The ability of the chief of staff to guide the staff through the transition is dependent upon his ability to provide adequate feedback. In order to be adequate, the feedback must provide task motivation and task learning information. The requirement to provide task learning information implies that the chief of staff is experienced enough to be able to teach the task. If the chief of staff does not have this experience, then both he and the staff face the possibility of pursuing erroneous strategies while executing these new analytical tasks. This would delay the staff even further as it tries to achieve a high level of staff validity.

Of the three criteria analyzed, two of those three were found to be dependent upon experience. The transition from the MDMP to the operational planning process and the execution of the three new analytical tasks associated with that transition, require a great amount of experience from both the staff and the chief of staff. If the transition from a division or corps headquarters did not introduce these new analytical tasks, the transition would only be dependent on the feedback at the task motivation level. Therefore, because of the demands for experience imposed by these new tasks, the recommendation is that the Army adapt the joint operational planning process as its decision making process at the division and corps level.

CONCLUSION

At the corps and division level, should the U.S. Army adopt the decision making process found in Joint doctrine rather than maintain its own distinct process? The answer to this question began with the presentation of a theory for decision making in staffs, the expansion of that theory to show the effects of feedback and experience, and a theory describing how feedback modifies behavior and shapes experience.

Decision making processes were described as methodologies to collectively focus the staff's limited attention. The structure of a decision making process represents a compromise between the expenditure of resources—time—and the benefit from the analysis. The MDMP and the operational planning process were compared. When the staff transitions to using the operational planning process, three analytical tasks are introduced. Developing experience in these new analytical tasks is the key to improving the staff's performance.

Because the obstacle to the staff's performance, caused by the new tasks, is overcome through experience, this monograph recommends that division and corps staffs use the operational planning process.

NOTES

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¹⁹ *Ibid.*, 183.

²⁰ *Ibid.*, 185.

²¹ *Ibid.*. The experimental task was a fictitious six-cue medical task. The six cues were divided between three domains of knowledge. Three experts would render judgements on the cues in their respective domains and present their judgements to the decision maker. The decision maker would then make a decision on the severity of the patients illness. The experiment was designed so that they could vary the validity of the information cues or they could vary the abilities of the experts.

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³⁵ Hollenbeck, et al., "Multilevel Theory," 303-304.

³⁶ Hollenbeck et al., "Extending the Multilevel Theory," 269-282.

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⁴⁰ Ibid.

⁴¹ A **feedback-standard gap** is defined as the difference between observed performance and an established goal or standard.

⁴² Kluger, 260. Using an example of a soldier's performance on the physical fitness test where the soldier's score was twenty points less than the goal that he had set for himself. With a feedback standard gap of negative twenty points, the soldier can increase his performance, reduce his goal, reject the score as being flawed, (the sergeant was picking on me and didn't count several of my pushups), or the soldier can decide that high scores on the physical fitness tests are unimportant.

⁴³ Ibid., 263-267.

⁴⁴ Ibid., 268.

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⁴⁷ Hollenbeck's reference to experience is not referring to competence. Competence was measured as a separate non-core construct. According to Hollenbeck's experiment, experience was measured and manipulated by the number of iterations of the decision making process made by the staff.

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⁵⁵ Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, (Portland: Frank Cass Publishers, 1997), 13.

⁵⁶ *CJCSM 3500.05*, 5-II.

⁵⁷ Joint Staff, *Joint Pub 3-0: Doctrine for Joint Operations*, (Washington, D.C.: GPO, 1995) III-20.

⁵⁸ *Ibid.*, III-21.

⁵⁹ *CJCSM 3500.05*., 5-II-8.

⁶⁰ *Ibid.*, 5-II-12.

⁶¹ Joint Staff, *Joint Pub 1-02: Department of Defense Dictionary of Military and Associated Terms*, (Washington, D.C.: GPO, 1994) 151.

GLOSSARY

- Accuracy.** The ability of the staff member to properly weight the relevancy of the information cues and is measured by comparing cue utilization with cue validity
- Achievement.** The degree to which the actual decision matches the optimal decision.
- Actual Decision.** The decision made by the decision maker based upon the actual weight given to the information cues.
- Actual Weight.** The decision maker's perceived relevance of an information cue towards a decision.
- Constructs.** Subordinate activities within a model that allow the theorist and researcher to analyze and represent the behavior they are studying
- Core Constructs.** Those constructs that have a causal relationship to each other.
- Cue Utilization.** The actual weighting of the information cues by the staff member
- Cue Validity.** The optimal weighting (from Brunswick's model).
- Expert Utilization.** The actual weight given by the decision maker to the predictive judgment of each staff member.
- Feedback-Standard Gap.** The difference between observed performance and an established goal or standard.
- Hierarchical Teams.** decision making teams composed of individuals who differ in areas of specialization and status. Members of hierarchical teams have a common goal, depend on each other for information related to the team's success, and influence each other during decision making. Hierarchical teams do not vote nor do they have to reach a consensus; the leader makes the decision for the team.
- Information Cues.** Information that is relevant to the decision being made.
- Non-Core Constructs.** Variables and activities that affect decision making achievement by affecting one of the core constructs.
- Optimal Decision.** The theoretically correct decision based upon the optimal weights of the information cues.

Optimal Weight. A theoretical weight representing the ideal relevancy of an information cue in a perfect world where all the causal relationships are understood

Weight. The amount of relevance an information cue has towards the decision, as compared to other information cues.

Weighting. The processes of assessing the relevancy of information cues towards a decision.

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