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Advanced Team Decision Making: A Model and Training Implications

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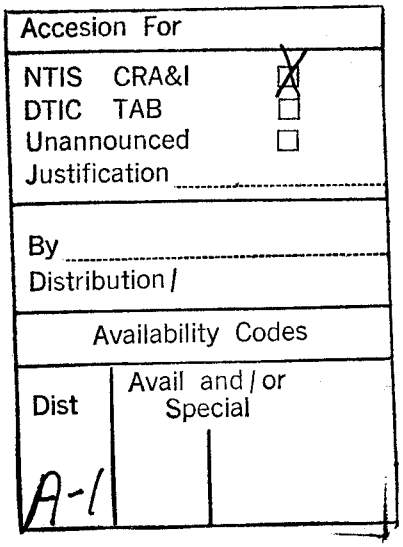

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13. ABSTRACT *(Maximum 200 words)* In this research, our primary goal was to develop a theory-based training program that would enable U.S. Army Officers to achieve more effective strategic team decision making. Commensurate with Small Business Innovation Research program aims, our secondary goal was to commercialize this project beyond the testbed domain. We were successful in achieving both goals. First, we produced a model of Advanced Team Decision Making (ATDM) and an accompanying training program that has been embedded in the strategic decision-making curriculum of the Industrial College of the Armed Forces. Results of a formative study lend positive support to (a) the validity of core concepts of the ATDM model; (b) the relation of the model to common constructs in the current teamwork literature; (c) the conclusion that trainees improve their ability to discriminate good versus poor decision-making behaviors when given guided practice with the model; and (d) the conclusion that trainees improve their awareness of the link between their team product's quality and their ability to engage in ATDM behaviors. Second, we have commercialized the program within a new domain that extends the model's applicability from strategic planning and decision making with ad hoc teams to tactical planning and decision making with both ad hoc and intact teams.

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FOREWORD

While a great deal is known about decision making by individuals, less is known about the processes by which group decisions made, especially decisions by groups composed of relatively senior organization members who are decision makers in their own right. However, it is reasonably well established that senior and strategic leaders must be able to operate in the context of groups making strategic decisions and must be able to influence the directions these groups take. Even more important, senior and strategic leaders must be able ensure that decisions are of high quality.

The work described in this report is an outgrowth of research at the level of the individual decision maker in a relatively new field of decision science: naturalistic decision making. The end product was a training program designed to create awareness in group members of the information processing tasks critical to reaching quality group decisions and skills in monitoring the effectiveness of the group in accomplishing these tasks.

ACKNOWLEDGMENTS

Like all major research projects, this one could not have been successfully completed without the contributions of many people. First, our research team would like to thank our contract monitor, T. Owen Jacobs, for his support and advocacy throughout the course of the project. We greatly appreciate this opportunity for theory-building, and for the chance to incorporate theory into an applied product.

Our research team would also like to acknowledge and thank the many decision-making team members we observed and with whom we interacted at the Industrial College of the Armed Forces, the U.S. Army War College, the Exercise Operations Division of the Wargaming Center at Maxwell AFB, the Air Force Institute of Technology, Wright State University, and the University of Dayton. Thanks also to advocates within these institutions, without whom we could not have proceeded: Bart Michelson, LTC Gail Arnott (USAF), John Johns, CAPT Jack Reddinger (USN), CAPT Fred Meyer (USN), Herb Barber, COL Rich Goldsmith (US Army), COL Bob Brace (US Army), COL Phil Mock (US Army), Pat Bresnahan, and MAJ John Scott (USAF). In addition to advocating on our behalf, they share in the theoretical development of the model and its application to a usable training technology through their many discussions with us and their thoughtful feedback about our work in progress. Here, special thanks go to Bart, Gail, Herb and Bob.

I would like to express my personal gratitude to the team of researchers who, with me, formed the core of this project: Gary Klein, Molly Kyne, and David Klinger. This truly was a team effort, and the project's success can be traced to the team.

The final report also represents a team effort. I offer special thanks to Gary Klein, Molly Kyne, and Beth Crandall for written contributions, and to David Klinger for production of statistical analyses. Thanks to Beth also for managing the data analyses, for her insightful conclusions, and for her editorial support. I also want to express my gratitude to Barbara Gasho for unflagging report production management, and for her editorial expertise. And, many thanks to our production specialists: Mary Alexander, Vicky Shaw, and Debbie Goessl.

Finally, we want to acknowledge the merits of the Small Business Innovative Research (SBIR) program. It provides opportunities for small firms to create needed products and technologies for clients in the military, and it encourages technology transfer to clients in the commercial sector. In the case of this project, the SBIR program supported theory development in the area of team decision making, the development of a successful technology for training advanced team decision making within the curriculum of the Industrial College of the Armed Forces, and the transfer of that technology to users outside that domain.

ADVANCED TEAM DECISION MAKING: A MODEL AND TRAINING IMPLICATIONS

EXECUTIVE SUMMARY

Research Requirement:

Our goal was to develop a theory-based training program that would enable officers to achieve more effective strategic team decision making. Since these officers are expected to operate more and more as members of ad hoc teams, rather than on members of intact teams, the focus of the training program was to provide them with the skills they need to observe, diagnose, and improve the decision making of teams on which they may serve for only a brief period. Thus, the focus was not on long-term team-building activities.

We wanted the training to be based on a memorable and intuitively appealing model of advanced team decision making that captured how high performance, strategic level teams actually make decisions. And we wanted to design the program so that instructors could become adequately prepared to apply it by using roughly the same level of effort that is normally expected from similar training programs.

Procedure:

The training program was developed by both theory-driven and data-driven methods. Before beginning work on this contract, we developed several theoretical approaches to understanding decision making and teamwork. This thinking was the foundation upon which our early efforts at team observation and data collection were based. Once we began our observations, we relied more heavily on our data and feedback from participants to drive our understanding of team decision making and to further develop our theory. The observations were conducted in the form of field studies with teams experienced in the domain of their team decision-making activities.

Over the course of this contract, we observed numerous teams engaged in decision-making exercises at the Air Force Institute of Technology (AFIT), the U.S. Army War College (USAWC), and the Industrial College of the Armed Forces (ICAF). Some were high-performance teams, others were not.

Our initial work consisted of a preliminary team decision training program conducted as AFIT, where our goal was to train teams to engage in the behaviors that we had observed high performance teams demonstrate. Data collected from the AFIT study demonstrated the utility of the team decision-making behaviors we had identified as critical to team performance.

Based on these findings, we conducted subsequent trial training programs at USAWC and ICAF. We collected observations from these studies and feedback from faculty and students and refined our model of team decision making and the accompanying training program through several iterations. The final model and training program were specifically tailored to fit within ICAF's curriculum as a key component of their course entitled "National Security Strategy."

Findings:

Based on our observation of strategic decision-making teams, we identified 10 key behaviors essential to high-performance teams. We have organized these behaviors into a model of Advanced Team Decision Making (ATDM) that addresses not only the teamwork but also the taskwork demands placed on decision-making teams. The model consists of four behaviors critical to Team Identity (the extent to which team members see themselves as an interdependent unit and operate from that perspective), and four behaviors critical to Team Conceptual Level (the cognitive level at which the team approaches their task, given that the team is an intelligent entity, capable of thinking, solving problems, making decisions, and acting). Last, the model describes the process of Team Self Monitoring and two key behaviors associated with the monitoring function as the means by which the team recognizes its level of functioning on all key behaviors and makes necessary adjustments and improvements.

A study conducted at ICAF at the conclusion of this project revealed the following:

1. *Validity of Core Concepts of the ATDM Model*. There is support for the notion that each of the three core components of the ATDM model are single factors that tie together performance on their respective key behaviors.

2. *Relation to Teamwork Literature*. The 10 key behaviors of the ATDM model are associated with frequently encountered dimensions in the teamwork literature that describe team performance at a more global level: anticipation, coordination, communication, and cooperation.

3. *ATDM Training Impact on Self Evaluation*. The effects of practicing Advanced Team Decision Making behaviors on teams' self-evaluation of their work sessions are a growing understanding of the ATDM model and an improved ability to discriminate what constitutes good versus poor team decision-making behaviors.

4. *ATDM Training Impact on Team Product Quality*. Over time and opportunities to use and observe ATDM during exercises, teams come to a better understanding of the link between the model and the quality of their product. Second, across teams, participants develop a more consistent, shared view of that link with more practice using the ATDM model.

Utilization of Findings:

The ATDM model was applied via a training program we designed for ICAF to teach decision-making teams how to improve their decision-making skills by employing concepts from the model in their teamwork sessions. As a result of this program's success, and because of the positive responses of faculty we trained to implement the program, the ATDM model has been embedded in their core curriculum.

The model has utility beyond ICAF. We have contracted with one outside client to train their teams in Advanced Team Decision Making, and we are finalizing an additional contract. The work is moving smoothly from research to application.

We are working with the U.S. Army Research Institute for the Behavioral and Social Sciences, Monterey, to adapt the model for use in tactical team operations including not only planning but also execution of team operations.

ADVANCED TEAM DECISION MAKING: A MODEL AND TRAINING IMPLICATIONS

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ADVANCED TEAM DECISION MAKING: A MODEL AND TRAINING IMPLICATIONS

INTRODUCTION

This is report describes the theoretical and empirical basis of our model of Advanced Team Decision Making (ATDM) and a procedure for training teams in advanced decision-making skills. Section One identifies the theoretical constructs that lay at the root of this project.

The second section is more directly about Advanced Team Decision Making. It is divided into four major parts. Part One offers an overview by summarizing the goals of this project. Part Two summarizes an early field study that guided the development of the model. Part Three bridges the gap between our early orientation on this project and our final product. Part Four is divided into three topical areas: (1) our objectives for the ATDM model followed by both a brief and a full description of the model; (2) a description of the method we used to train instructors and students to acquire the skills of advanced team decision making; (3) results of a concluding study conducted at ICAF. This study examined the change in student performance over time, while using the model to improve their team decision making. The study also revealed information about the construct validity of the model's 10 key behaviors.

The third and concluding section of this report contains a look back at the theoretical base that guided our early work developing this model and a discussion of the theory development that accrued as a result of this project. It ends with a look to the future by describing plans for two organizations to incorporate the ATDM model into their working environments and discussing a project (also funded by U.S. Army Research Institute for the Behavioral and Social Sciences) in which we attempting to adapt the ATDM model to teams engaged in the tactical execution phase of military missions.

SECTION ONE: EARLY THEORETICAL ORIENTATION

This project was designed to help us understand how strategic teams make decisions, where they run into trouble, and how to train the members to improve their teamwork. Most existing models of team performance do not directly address decision making. Some models do not mention decision making at all. For example, Glickman, Zimmer, Montero, Guerette, Campbell, Morgan, and Salas (1987) list eight dimensions: communication, cooperation, team spirit and morale, giving suggestions or criticism, acceptance of suggestions or criticism, coordination, adaptability, and infrequent incidents. These dimensions relate to how well the team works together, and some of them (e.g., communication, cooperation) appear to be related to team decision making. However, the dimensions are not unpacked into the specifics of what the team does to make decisions. The same is true of McIntyre and Dickinson (1992), who list seven factors that emerged when they studied critical incidents in teamwork: communication, feedback, backup behavior, team orientation, monitoring, coordination, and team leadership. Again, some of these factors relate to decision making, but they are not specific about decision making. One last example is the work of Fleishman and Zaccaro (1993), who list seven factors: team

orientation, resource distribution/load balancing, activity pacing, response coordination, procedure maintenance, systems monitoring, and team motivation functions. This set seems more closely tied to the way a team performs its job, particularly the elements of resource distribution/load balancing, response coordination, activity pacing, and systems monitoring. Still, the framework is aimed at an ongoing team at work, and not at the decision making in which advanced teams must engage.

Clearly, all of these factors are important, but they have not been directly or specifically linked to decision making. Most of the factors speak to ways that a team learns to coalesce, and then works together in performing its tasks. But they do not speak to ways in which the team makes its decisions. Since we were interested in strategic decision-making teams, we needed a clearer understanding of how they make decisions.

Some studies do address decision making. For example, Franz, McCallum, Lewis, Prince and Salas (1990) identified seven critical behaviors during helicopter crews' pre-flight briefings, and validated these behaviors in a study of performance during simulated flight. The seven behaviors were: mission analysis, assertiveness, flexibility, situational awareness, leadership, decision making, and communication. They found that decision-making behaviors displayed during the pre-flight brief were correlated with decision making during the simulated flight. Franz et al. focused on several aspects of decision making—gathering information before making a decision, cross checking information, and identifying alternatives and contingencies. This study demonstrates the importance of giving more consideration to the way teams make decisions.

Orasanu and Salas (1993) and Cannon-Bowers, Salas, and Converse (1992) have identified the importance of shared mental models for team effectiveness. To the extent that shared mental models promote the situational awareness that teams need in order to make better decisions, this suggests the value of having teams clarify and update situational awareness. Helmreich (1984) has also presented evidence showing the importance of communicating situational awareness during decision-making tasks.

Orasanu (1990) has taken the study of team decision making deeper, examining the categories of comments in commercial airline cockpits during malfunctions in simulated flights. Orasanu compared high-performing and low-performing teams with regard to problem-solving comments (e.g., recognizing problems, stating goals and sub-goals, planning, gathering information, alerting, predicting, explaining), resource management, and standard operating procedures. Orasanu concluded that:

> "If we want to improve performance by pilots and others in similar task environments, should we focus on training them to be more rational decision makers? Or should we train them to interpret cues, be metacognitive, make plans, build shared situation models, and manage their resources? I would place my bets on the latter. Evidence is accumulating on the lack of success of 'debiasing' efforts and efforts to improve deductive reasoning (Cheng,

Holyoak, Nisbett, & Oliver, 1986). On the other hand, positive evidence is accruing on training in perceptual skills needed for situation assessment (Gettys, Pickett, D'Orsi, & Swets, 1988), on metacognitive skills (Nickerson, Perkins, & Smith, 1985), and on resource management skills." (pp. 16,17)

While Orasanu's work concerned very small teams—airline cockpit crews—the implications for larger teams are clear. These efforts constitute an important start in the examination of team decision making. Our work has extended these themes by probing more deeply into the strategic decision making of teams.

Our approach was to directly address the decision making of teams, rather than more-general aspects of teamwork such as morale, communication, coordination, or other global characteristics. We believed we could make significant progress because of our previous work on individual decision making, particularly our examination of naturalistic decision making, and our description of recognition-based strategies.

We had worked within a naturalistic decision making framework (Klein, 1989, see also Zsambok, Beach, & Klein,1992) to explore the strategies that experienced decision makers use to handle conditions such as time pressure, ambiguity, missing data, ill-defined goals, and high stakes. This work contrasted with classical research on decision making, which focuses on analytical procedures such as decision analysis, Bayesian statistics, multi-attribute utility analysis, and principles of deductive logic. Researchers have found that in many controlled settings these analytical procedures were not used by subjects (Beach & Lipshitz, 1993), and in more naturalistic settings the procedures often could not be applied. The striking feature of naturalistic strategies is that they allow decision makers to use their experience to handle the difficulties encountered in their jobs. This work on naturalistic decision strategies helped prepare us to study strategic team decision making, and to identify the factors that differentiated successful and unsuccessful teams.

Our work on naturalistic decision making had identified a common recognitional strategy (Recognition-Primed Decision Making) whereby people used their experience to perceive the key dynamics in a situation, and to thereby identify plausible goals, critical cues, diagnostic expectations, and reasonable courses of action (Klein, 1989; Klein, Calderwood, & Clinton-Cirocco, 1986). In our studies we found that decision makers were able to evaluate a course of action by mentally simulating it to see if it would work, and either adopt it, improve it, or reject it and then consider another course of action. We found that this recognitional strategy was very frequently used, even for difficult instances. Therefore, we expected that we might find these same processes when we studied teams. This was another way in which our work on individual decision making helped guide us in our work with strategic decision-making teams.

We had also collected observations of teams during earlier research projects, and these helped us to see how models of individual decision making could apply to strategic teams. One study looked at an operational planning team, at the battalion level, in an

ARTBASS simulation at Ft. Hood (Thordsen, Galushka, Klein, Young, & Brezovic, 1990). The team we studied used a recognitional strategy very similar to what we observed with individuals. Situations were recognized in a similar manner. Courses of action were evaluated through a collaborative mental simulation of consequences. Calderwood and Thordsen (1989) also found that shared situation assessment was important in a study of strategic planners at the National Defense University. So we were prepared to emphasize the way a team formed and shared its situation assessment. We also expected to find successful teams using more mental simulation to evaluate their options.

Thordsen, Klein, and Wolf (1992) found that helicopter teams used expectations in a number of ways. One of the most important was to create a shared time horizon, so that the navigator could help the pilot to anticipate what was going to be seen after the next landmark, thereby facilitating rapid movement through complex terrain. This concept of time horizon was also described by Jacobs and Jaques (1991) to distinguish among individual decision makers at different levels of strategic expertise. Therefore, we were prepared to see successful teams mirroring successful individuals in their ability to look further into the future. For a team, this ability would require it to draw on the experience of its members, and to synthesize the efforts of those members gathering information with those creating the plans.

Another study showed some of the limitations of a recognitional model of individual decision making for understanding team performance. Thordsen (in preparation) collected a set of 60 decision errors committed by teams in different settings. He obtained ratings on the nature of these errors, seeking to match the errors to the processes described by a recognitional model of decision making. While it was possible to account for many of the errors using a recognitional model (e.g., failures in understanding goals, mistaken expectations, poor mental simulation), a great many errors fell outside of processes in the recognitional decision-making model, and were attributed to poor team management. The teams were unable to monitor and control their own behaviors, and these management problems resulted in many of the errors Thordsen identified. From this study, we realized that a simple translation of the RPD model about individual processes to team processes would not be sufficient. The recognitional model of decision making dealt with the reasoning strategy used to make decisions and did not seek to incorporate processes such as metacognition and time management. These additional cognitive processes would have become important if we had been seeking to train decision makers. Means, Salas, Crandall, and Jacobs (1993) have shown that metacognition is one of the general skills that can be effectively trained to improve individual decision making. Therefore, if we wanted to train teams to make better decisions, we expected that we might find it useful to improve their metacognitive, or self-management skills.

Our earlier work on individual decision making also helped us form a framework for understanding teams. Because we were starting with the analogy to individual decision making, it seemed reasonable to look at teams as entities in order to probe the nature of a team's decision-making processes. In a project with commercial airline crews (Klein &

Thordsen, 1991), we found that we could treat the crews as intelligent systems. The crews emitted behaviors just as individuals did, regardless of which of the crew members took which enabling action. This way of perceiving teams fit nicely within a naturalistic decision-making perspective, and further helped us consider the recognitional strategies used by these intelligent entities, the teams.

Therefore, we had arrived at a position in which we were prepared to study the ways teams made decisions, rather than just to look at general issues such as morale, communication, and so forth. We wanted to go farther than merely asserting that decision making was an important aspect of team performance. We were interested in determining how teams made decisions. Following our work with individuals, we assumed that situation assessment would be critical for team decision making. Situation assessment would help teams form expectations, and these in turn would let teams identify gaps and ambiguities in projected events and outcomes. Expectations would also affect the way teams formulated time horizons for directing their attention. We hypothesized that mental simulation would be important for teams, both to diagnose a situation and to troubleshoot a promising course of action. In line with the recognitional model of individuals, we also anticipated that goal clarification would be a key component of the decision event. Last, from our early work with teams, we assumed that the team self-monitoring function would be important for managing a variety of team processes related to decision making.

The question facing us was whether these concepts would constitute a sufficient set to describe team decision making. Then, our task was to transform these concepts and components into a tightly linked theoretical model of team decision making, and to select those critical behaviors with the greatest impact and value for training. There were many points of correspondence between our work with individual decision makers and our early work with teams. In order to formulate a useable approach for training people to work effectively in strategic decision-making teams, we needed to synthesize the various concepts into an overarching model of team functioning.

SECTION TWO: ADVANCED TEAM DECISION MAKING

Part One: Overview

As we began this project, **one aim** was to refine our understanding of how teams make decisions, just as we had refined our understanding of individual decision making in studies surrounding the development of the Recognition-Primed Decision (RPD) model (as described in Section One). We wanted to clarify and expand on our ideas about what the key decision-making behaviors are that experienced teams use in their natural work environments.

A **second aim** was to understand those processes that are particularly important for *strategic* decision-making teams—teams whose work requires that some portion of their focus include crafting policy, or setting goals, and developing a broad-brush course of action to

fulfill them. These are teams who need to look into the future, and consider the long-term consequences of their plans. These teams also need to look at a broad set of interacting factors, and consider not just their own goals and situation assessment but also those of other organizations, systems, and forces that are a part of the context that surrounds and affects them.

A **third aim** was to generate a memorable theory or model of advanced team decision making that would be useful to team members in helping them to improve their team's decision-making process. To be memorable, the theory or model would need to be concise and intuitively comprehensible. To be useful, it not only would need to be memorable, but it also would have to reflect how high-performance teams operate.

A **fourth aim** was to create a training package that could be used *in situ* at senior joint/service colleges like USAWC and ICAF. This meant the training needed to be compatible with the constraints of their curriculum, their class schedule, and the institutional norms concerning level of effort for instructor and student preparation. It also meant that the training needed to teach individual team members how to improve the functioning of ad hoc, rather than intact decision-making teams. The training was not to be directed at intact team-building activities, since these students would be serving on more and more ad hoc teams and task forces in the future. Specifically, the package would be used by instructors to help teams

- gain a conceptual understanding of advanced team decision making
- acquire the skills of advanced team decision making
- learn how to engage in team self-evaluation and team self-improvement.

The products that we developed to achieve these four aims are the model of Advanced Team Decision Making, and an accompanying training package. This section describes these products. Before turning to them, we will first summarize results of an initial study we conducted, which we used to refine our conceptions of the key decision-making behaviors and to gain practice with training techniques.

Part Two: An Initial Study

Our early observations of decision-making teams included such events as the National Security Strategy exercise at the National Defense University; the Joint Land, Aerospace, and Sea Simulation (JLASS) at the Wargaming Center of Maxwell AFB; and Tempomatic IV, a corporate management and planning simulation for advanced graduate students of Business Administration at Wright State University. From these and other observations, and from the early theoretical work we had completed, we developed a set of team decision-making behaviors which our data indicated were important to effective team decision making. These data consisted of notes taken by each of our staff observers (N = 2 - 5 observers, depending

on the team being observed) concerning the teams' behaviors and discussions during work sessions. We evaluated our notes independently and then as groups, with the goal of identifying categories of team behaviors that accounted for our observations. These categories, which we later referred to as "effective behaviors" are shown in Table 1.

Table 1

Initial Set of "Effective Team Decision-Making Behaviors"

Information Utilization

- Range of factors considered
- Uncovering and filling gaps
- Exchange pattern
- Tracking
- Anticipation
- Confirmation
- Clarification
- Agreement

Field of View

- Time horizon
- Time management
- Scope

Intent (Goal Orientation)

Team Member Utilization

- Roles
- Involvement
- Workload
- Micromanagement
- Assistance

In an initial study, we investigated the usefulness and comprehensiveness of this set of behaviors. For a full description of the "effective behaviors" as well as a report of this study, see Zsambok and Kyne (1991). Briefly, we conducted an experiment at the Air Force Institute of Technology (AFIT) in Fairborn, Ohio, where students were engaged in a strategic planning and management exercise called Main-Man-X.

In this scenario, students are a part of a Wing that will be activated as an operating unit. The system to be maintained is an advanced tactical aircraft. All activities are consolidated under the Wing Commander, who will be assisted by team members fulfilling specific roles.

The simulation is played over a period of three days; each day represents one month's operation, and the unit is expected to reach complete operational readiness in three months. To reach operational readiness, the Wing Commander and team members must develop an analysis of the full spectrum of requirements facing them. They must also develop strategies for acquiring the resources they will need to support the aircraft, and balance these against additional resources that will be needed to support special projects that appear with varying amounts of predictability and probability. To succeed in this exercise, the team needs to develop a strategy that simultaneously (1) anticipates ever-increasing demands against its resources; (2) encompasses wide enough margins to absorb unpredictable draws on its resources; (3) does not exceed the upper limits of potentially available resources. Available reports help the team determine which aspects of the operation are out of line, so that they can adjust their plans. The exercise is a difficult one because the aircraft is new, limiting the amount of historical information available. Further, the information is subject to multiple interpretations, and the situation is dynamic.

We observed all sessions at this exercise, and provided feedback about team performance following the first and second work sessions of the two treatment teams. The format of our feedback sessions included our and the team's evaluation of their team's demonstrated decision-making performance, our description of "effective team behaviors" (from the above set), and discussion of the relation of their demonstrated behaviors to the set of "effective behaviors."

The control team did not receive our feedback, but they did receive the standard (minimal) team performance coaching from instructors, which consisted primarily of comments on the content of their decisions, and little about their decision-making processes.

We collected two types of outcome measures. The first concerned each team's decision-making behaviors; the other concerned the quality of each team's product. For the first measure, two trained observers independently rated each team for its use of key team decision-making behaviors after each work session, using a prepared questionnaire. The questionnaire contained items that related to each of the "effective behaviors" on the above

list. For the second measure, an objective standard was applied by faculty instructors to score the quality of the product created in each work session by each team.

Results showed that the treatment team improved by 73% in its ability to demonstrate the behaviors on the "effective behaviors" list. The control team improved by 28%. This is not surprising, since the treatment team received direct feedback about its performance on each of these behaviors. But, this is an important outcome, for two reasons: First, the 73% gain by the treatment team demonstrates that these behaviors are trainable. Second, the improvement of 28% by the control team suggests the behaviors' importance; with practice, we should expect that teams will improve in their performance of these behaviors as a part of their natural evolution. However, without focused attention to these behaviors, natural improvement would be expected to be slower and probably would not reach as high a level of effectiveness even with considerable time.

Written evaluations by the treatment team members at the conclusion of the experiment revealed that they agreed with our assessments of their team during the feedback sessions, that they believed the "effective behaviors" were critical to successful team decision making, and that they did not believe other behaviors needed to be added to the list of "effective behaviors." Faculty instructors who also evaluated the list likewise did not add other behaviors. Our own staff also evaluated our ability to describe either the treatment or the control groups' performance in terms of the "effective behaviors." We found that we did not need to invoke additional concepts or behaviors in order to evaluate the teams' decision-making performance, and that we used all those present on the list in order to account for the range of behaviors we observed over the three-day exercise period. Inter-rater reliability was high (coders agreed on 85% of all initial category ratings).

The objective measure of team product quality revealed that the treatment team's product steadily improved and then surpassed the control team's product in its quality, over the three-day period. This result established a link between improvement on these key behaviors and quality of the product that the teams produced. AFIT instructors used their standard criteria to assign a "productivity factor" to their teams after each exercise interval. Results showed that the treatment team began with a lower productivity factor that the control team, but steadily increased and then surpassed it by the end of the fourth and final session. Consecutive productivity factors for the treatment team were 65%, 75%, 88%, and 92%; for the control team they were 75%, 85%, 85%, and 85%.

These results are a product of a pre-experimental design (Campbell & Stanley, 1963), and therefore are subject to threats to internal validity which can weaken the amount of confidence we have in the outcome of the study. We discussed these possibilities in Zsambok and Kyne (1991), in conjunction with interview data from the faculty instructors and additional information about the participants in both the control and the treatment groups.

Based on those additional assessments, we concluded that there is reasonable evidence to support these assumptions:

1. Teams can learn how to use "effective team decision-making behaviors" when they receive feedback about their performance relative to these "effective behaviors."

2. Teams that receive this feedback experience a greater gain in improved team decision-making performance than teams that do not receive this feedback.

3. This particular set of "effective behaviors" is sufficient to evaluate and describe team decision-making behavior.

4. There is a positive relationship between team improvement of "effective behavior" performance and the quality of the team's product.

Part Three: Bridging the Gap

Although it is not our intent to recount the history of the ATDM model's development, a brief summary is offered here to bridge the gap between our early thinking and the final product, the ATDM model and training program.

One of our concerns after we completed the AFIT study was that the metacognitive component of our work was essentially hidden from view, although it was represented indirectly via the review sessions that we facilitated. In each review, we asked the team to reflect on their previous work session in terms of whether they used the "effective behaviors," and how well they performed them. And, we facilitated discussion about how the team might improve its use of the "effective behaviors" in subsequent work sessions. Thus, our goal was to teach team members to monitor, evaluate, and adjust their team decision-making processes.

Yet, the act of metacognition was not represented as a behavior on our list of "effective behaviors." Rather, it was embedded within the structure of our training program via the feedback sessions. We considered the metacognitive component to be paramount to helping teams improve their team decision making.

Our reasons for this belief can be summarized as follows: Educational psychology researchers have repeatedly demonstrated that when students are taught how to study—when they are taught particular cognitive strategies—they can improve in a wide variety of abilities, like reading comprehension (Brown & Palinscar, 1989; Palinscar & Brown, 1984) and problem solving (Glaser, 1990; Hayes, 1980), to name just two. Here, teaching students about these learning strategies was the key.

It is also widely accepted that students who already possess certain learning skills or strategies do not always spontaneously use them (Garner, 1987; Kail, 1983). For example, Robinson (1970) found that students improved in their comprehension of text material when given instruction to use learning strategies that were present in their repertoire all along.

Here, students needed to be instructed to monitor their cognition so they could identify instances when they were not using relevant strategies and then consciously invoke them.

"Self-control training" (Garner, 1987) combines both teaching about strategies and teaching about monitoring. "In self-control training, learners are instructed in the use of a strategy, and they are also explicitly instructed how to monitor and evaluate their strategy use." Based on her literature review, Garner concluded that "strategy-plus-control training produces enhanced initial performance and transfer of the instructed activity."

In their review of literature about training decision makers for their real-world settings, Means et al. (1993) concluded that "metacognitive skills may well constitute the best candidates for generalizable skills that will aid decision making across domains....better performers employ metacognitive strategies, and teaching the strategies to poorer performers leads to improvement on the task."

In that review, Means et al. (1993) also found that for executive-level decision makers, the ability to plan for long-term goals—and not just for the immediate objective—is one key to successful performance. Another is consciously taking the perspective of the "other person." For operational decision making, workload monitoring and procedural flexibility are key metacognitive skills.

We wanted to extend the notion of metacognition in individuals to the team level. Just as individuals can think about their own thinking, and can manage their thought processes by invoking particular cognitive strategies, teams can become aware of how their collective decision making is unfolding, and can manage the processes they are using by invoking particular team decision-making strategies. We wanted to make the metacognitive, or regulatory, component of team decision-making training explicit to teams.

Therefore, we replaced the concept of "effective team behaviors" with the concept of the "Metacognitive Team." We developed the "Metacognitive Team" concept by describing those resources for team decision making that are critical for teams to monitor, modify, and manage. This description, in the form of instructional materials and an accompanying training program, were aimed at teaching teams what these resources are, and how to engage in team self-monitoring so they can modify the way they use these resources, if necessary, and manage them as strategies to enhance their team decision making.

The resources are similar to those described above as "effective behaviors," but we organized them differently, made some wording changes, and also altered a few of the items on the list to reflect what we had learned about team decision making since the previous iteration. (See Appendix A for summarized Metacognitive Team materials.)

One example of how we used the "Metacognitive Team" concept to understand team decision making derives from our observations of a strategic level decision-making team whose goal was to generate recommended policy to the Commander-in-Chief regarding a

simulated large-scale geo-political crisis which was unfolding over (compressed) time. The team was not very successful in balancing its need to look into the distant future to imagine the likely consequences of current plans and actions against its need to focus at times on impending, short-term crises.

By the third session, the team was functioning almost completely in a reactive mode. Consequences from unattended but immediate concerns began to accumulate, and threatened to swamp the team. The team began to narrow its focus from the wider range of factors affecting them to only a few. Although some members were aware of the problem (i.e., some monitoring was occurring), the team's few attempts to broaden its focus to a wider range of factors did not produce an effective situation assessment. They were unable to modify and manage the way they were using several of the key team decision-making resources, and they were unable to generate a realistic situation assessment or course of action. As a result, their product did not satisfactorily address the variety of competing pressures on the team—pressures from the military, political, economic, and technological components of the problem they faced.

At the conclusion of the simulation, this team said they had not been given sufficient resources (including time) to work the problem. Yet, a second team succeeded in developing a long-range and broad-based course of action while confronting immediate crises. A key difference was that the second team consciously questioned its decision-making strategy in terms of where it was focused. The team modified and managed the range of factors it was considering at various points in its deliberation. It also questioned its situation assessment in terms of whether near term and distant consequences of its plan were being captured, and modified both the assessment and plan several times to reflect this growing knowledge base.

Although the "Metacognitive Team" concept succeeded in directly communicating the monitoring, modifying, and managing functions that teams must apply to their team decision-making resources, our experience with instructors and students at the second senior service college where we introduced it convinced us that the term was too foreign for this environment. One of our goals was to have a product with immediate, intuitive appeal, which did not require a great deal of introduction before the concepts could be understood. It became clear to us that the concept "Metacognitive Team" required too much explanation to be immediately grasped. We dropped the term as a name for the model, but retained the concept of team self-monitoring as one of the major components of team decision making in subsequent iterations of our work. We also retained most of the "resources" of the "Metacognitive Team," but cast them into a new framework, and labeled them as *markers* or *key behaviors* in subsequent iterations.

Part Four: The Final Products

The Model: Our Objectives

The final conceptual structure and representational format that we developed to communicate the way experienced teams make decisions is the ATDM model. Our objectives for this model were:

- To describe the way experienced, strategic-level decision-making teams actually operate—our mission was not to search the team literature for prescriptive decision-making models

- To include those behaviors or processes that are *critical* to successful team decision making—not to describe every team decision-making behavior we observed

- To create a memorable aid for improving team decision making—one whose physical form brought order to the displayed concepts and whose terms were both intuitively comprehensible and also small enough in number to be remembered

- To describe the critical behaviors and processes in terms that are concrete and directly observable—as opposed to using abstract terms like "cooperation," which then require numerous observable behaviors to specify what is meant

The Model: A Shortened Description

In developing the model, we have relied not only on our early theoretical orientation (discussed in Section One), but also on data we collected from our team observation and training studies, and feedback we received from faculty and students with whom we interacted during numerous team decision-making exercises. These exercises were conducted at the Air Force Institute of Technology, the Wargaming Center at Maxwell AFB, the Army War College, and the Industrial College of the Armed Forces. The model depicts those team behaviors that our studies uncovered as critical to successful strategic team decision making, and it frames them in a manner consistent with the feedback we received from participants and instructors.

As depicted in Figure 1, the model focuses on three major components of team decision making: Team Identity, Team Conceptual Level, and Team Self Monitoring. Team Identity is the extent to which the team sees itself as an inter-dependent unit, and operates from that perspective during teamwork activities. It concerns:

- Members' understanding of one another's roles and functions, and how well they perform them, and the ability to uncover "hidden expertise"

- The level of involvement of each member in the task and the ability of the team to fully engage all members, even those who have disengaged

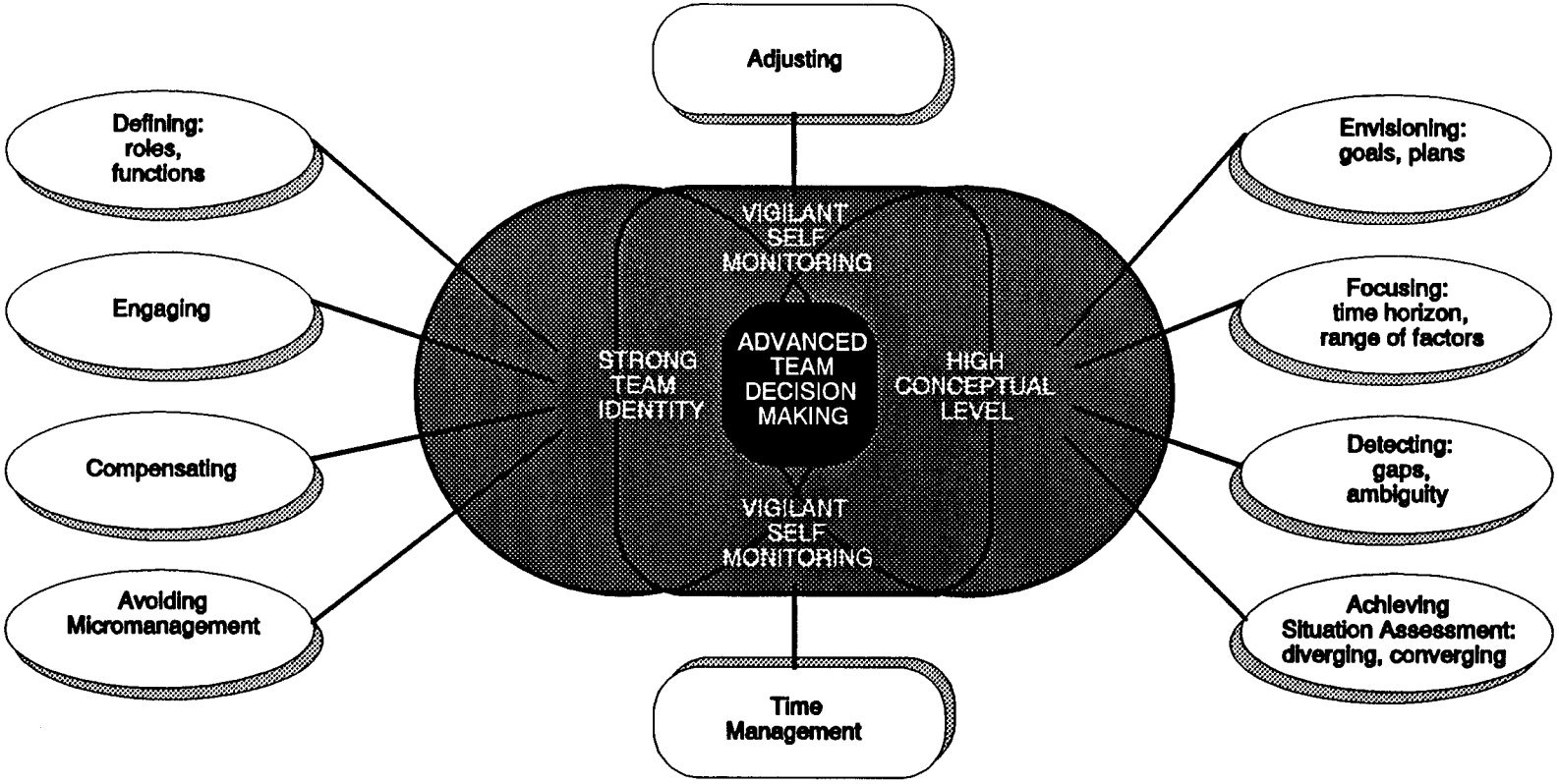

Figure 1. Advanced Team Decision Making model.

- The ability of team members to temporarily jump out of their role or function and compensate for gaps in the team's performance, without leading to uncontrolled free-wheeling on the one hand or masking chronic deficits on the other

- The ability of the team to avoid micromanagement (involvement with more detail than is warranted) either by the leader or by the team itself

Team Identity is the category most similar to the focus of attention in the literature on teamwork (Glickman et al., 1987; Nieva, Fleishman, & Rieck, 1985; Swezey & Salas, 1993), and in commercially available team performance or team building programs. Two differences between the literature and our model concerning the component of Team Identity are: (1) our shift of focus away from the leader and towards the team in ownership and resolution of micromanagement problems and (2) emphasizing a *balance in compensating*—a balance between flexibility in filling holes in the team's coverage of tasks versus inadvertently masking short-falls in other team members' ability to perform as expected (and thus failing to address the causes of poor performance such as workload imbalance, training deficits, inefficient allocation of tasks).

The second major component of the model, Team Conceptual Level, is a term that captures the notion of the team as an intelligent entity. It refers to the team's collective ability to think, solve problems, and make decisions in a given task environment. It also refers to the information explicitly known by all team members (as opposed to information known by one or a few members). Ideally, the team's Conceptual Level matches the demands of the task.

This component is similar to Wegner's (1987) concept of "trans-active memory system," or the "group mind" which possesses information processing capabilities (also see McClure, 1990). It is also similar to the term "team mind" (Klein & Thordsen, 1990), which is viewed as operating at the level of the full team's conscious awareness (as opposed to pre-conscious awareness, which is composed of information in individual members' minds and is not known by the whole team). Likewise, the concept of Team Conceptual Level resembles "group intelligence," the functional intelligence of a group of people working as a unit (Williams & Sternberg, 1988); and "distributed cognition" (Hutchins & Klausen, 1991) in which crews' shared thinking emerges as a system-level property.

Team Conceptual Level is a category not well represented in the teamwork literature. In our model, it concerns these abilities of teams:

- To clearly envision their goals and plans to reach them, both initially and as they change over time

- To focus appropriately on their time horizon (not so close that long-range implications of current actions are ignored, and not so far into the future that short-range problems are allowed to turn into crises) and at the necessary range of

factors (not so few that their deliberations lack real substance, and not so many that they become overwhelmed and confused)

- To actively seek out and then deal with instances of gaps and ambiguities in the team's information base or their situation assessments so that they resolve informational difficulties where possible, hold onto them as qualifiers and caveats to plans when not possible, and take action in the face of them when necessary

- To seek divergent situation assessments before closing in on a single accepted one, and to ensure that all members share the same understanding of the adopted assessment. Situation assessment also concerns the ability of the team to form expectancies, based on their assessment, and to use these expectancies as a reality check against their environment. Violated expectancies will cue the team to the need to update its situation assessment, but this will happen only if the team is primed to notice those cues

Of these four behaviors, the first—envisioning goals and plans—is the one most often encountered in the teamwork literature, with the other three rarely discussed. Situation assessment is sometimes discussed in terms of a shared mental model (Cannon-Bowers et al., 1992; Orasanu, 1990) where the emphasis is on sharing a common understanding across all team members. But rarely do models of teamwork extend the concept of situation assessment to include *both* divergence and convergence. Likewise, the concepts of (1) focusing on time horizon and range of factors, and (2) detecting gaps and ambiguities are missing from most of the team decision-making models we reviewed (for exceptions, see Olmstead, 1990; Smith et al., 1991). Yet our observations of decision-making teams revealed that they engaged in all four of these key behaviors relating to the Team Conceptual Level. We found ourselves unable to provide critical feedback to teams about their performance unless we had all four of these constructs available for review and discussion.

The third component of the model, Team Self Monitoring, is the master process of metacognition. For reasons described in Part Three, we chose the term "self monitoring," although "metacognition" is more apt, since it includes both monitoring and regulating (adjusting) the way the team is performing on all the key behaviors of the ATDM model. However, while less technically accurate, we chose the more user-friendly term "team self monitoring" as the label for this construct, and added "adjusting" to the model as a separate behavior relating to the monitoring function. We added the key behavior of time management to this component of the model, since we found that a team's ability to allocate, monitor, and re-prioritize available time was a special case of its self-monitoring ability across the other key behaviors related to Team Identity and Team Conceptual Level.

Following is a more detailed description of the 10 key behaviors of the model, as well as a case study that demonstrates how we would evaluate a decision-making team's performance from the ATDM perspective. This material is excerpted from a booklet that we created for ICAF students, to support the total ATDM training program we designed for the

National Security Decision Making curriculum (Zsambok, Klein, Kyne, & Klinger, 1992). The booklet is attached as Appendix B.

It is not necessary to read this more detailed description of the model in order to follow the remainder of the report. Readers who do not need more detail should skip to page 44, and begin with the portion titled "The Training Program."

The Model: A Full Description

Team Identity

Team Identity describes the extent to which members conceive of the team as an interdependent unit, and then operate from that perspective while engaged in their tasks. Think of a hockey team. Each member has his own role right wing, center, goalie but as they set up plays and bring the puck down the ice, those individuals begin to function collectively. Every player knows his own zone, where his teammates are, where the opponent is, how much time is left on the clock, what each of them needs to do to hold onto the puck, etc. Equally important, he knows that all of his team members know these things as well.

We have observed that, unlike this hockey team, the members of decision-making teams with weak identity are forced to play as individuals rather than as parts of a unit that work together. Such an observation may seem obvious; however, it speaks directly to the basic difference between decision-making teams with weak Team Identity which must rely on their own individual skills and those with strong team identity which are able to capitalize on the power of the group's shared expertise and collective approach to their task.

The quality of any given team's identity can be defined by how well the team is using the four processes, or behaviors, which promote strong Team Identity:

- *Defining roles and functions*
- *Engaging*
- *Compensating*
- *Avoiding micromanagement*

Thus, teams can advance in the strength of their identity by developing the ways they use these critical behaviors.

Defining roles and functions. Team Identity begins with the process of defining roles and functions so that each team member understands the task responsibilities and accountabilities of every other member. This shared knowledge and understanding enables teams to plan their moves, anticipate

what can or should occur when circumstances change, and react accordingly. For example, our hockey team players in one particular game know that on one of their opponent's line-ups, the center is particularly good at feinting to his left wing. Consequently, they concentrate most heavily on those parts of their roles and functions that involve protecting the goal from the right, but only when that lineup appears. Otherwise, they adopt their more typical play pattern.

Without this more detailed knowledge, team members cannot assess whether the functions assigned to specific roles (people) are even being accomplished, let alone addressed at the level of quality required to meet the team goal. Even worse, they are powerless to adjust these assignments and assist one another when the need arises.

Advanced teams we have watched did not lose this source of power: They actively and continuously sought complete awareness of their members' functions, which is of particular importance in the dynamic environment in which team decision making typically takes place. In contrast, basic-level teams we have observed had only a nominal awareness of roles and functions at the beginning of a team's work, which usually involved the perfunctory introduction of all team members and a brief and relatively uninformative description of their team responsibilities at the beginning first team session. However, we have seen that as teams develop their ability to use the role and function definition process, they recognize the need to highlight pertinent aspects of these roles and to emphasize how they relate to the task at hand. Also, they become primed for those situations where clarification needs to occur as changes in the situation demand shifts in members' approaches to the task.

The advanced use of the process provides several important benefits for the team, including the ability to:

- *Capture any changes affecting team performance that may have evolved as the team progresses in its work*
- *Identify shifts in a situation which call for the reassignment or expansion of tasks*
- *Assign team members to handle these new tasks*
- *Profit from the resource of "buried" expertise where team members have real-life experience relevant to a team task which is outside their assigned role*

Teams with strong Team Identity strive to achieve a deeper understanding of how the distribution of roles and functions helps the team reach its goals, enabling members to direct themselves toward these goals.

Engaging. Team Identity is fostered through the process of engaging, the extent to which the team capitalizes on team member participation in the team's work and responsibility for reaching the team goals. Basic level teams may have members who express their disengagement in a variety of ways: with the attitude of "just tell me what you want me to do and let me get on with my job," with the silence of non-participation during group discussions, with the failure to advocate a strongly-held position or express discomfort with the direction in which the team is headed.

We have seen that more advanced teams recognize that disengaged members are resources lost to the team and that they try to carefully secure the full value of each member. They are primed to act on evidence that members have partially or totally disengaged, so they can bring them back into the team. They watch for signs of the following shutting-down behaviors:

- *Failure to pay attention to an ongoing discussion*
- *Performance of a different task during discussion*
- *Demonstration of quizzical or negative facial expressions*
- *Lack of assertiveness in following up on a question or concern*

Recognizing these signals, teams with strong identity take on the task of drawing the disengaged member back in, whereas teams with weaker identity continue on the given course of action without attempting to change the situation. For example, we observed one decision-making team with a subject matter expert (SME) whose heavy foreign accent resulted in his disengagement. Frustrated with his inability to make himself understood and his team's unwillingness to invest the time in understanding what he had to say, the SME stopped participating. Not only was the valuable potential of his expertise lost to the team, but the team sent a dangerous message with significant possibility for a snowballing effect: that disengagement is tolerable, that the quality of a team's work will not be affected by the loss of some of its parts. When teams accept the disengagement of any member, they effectively give the team permission to operate without all of its resources.

The team does not have to lose these resources. The presence of disengaged members may be the symptom of a problem that can be solved. Members may be fatigued, overworked, or even overwhelmed by the magnitude of the task at hand. By recognizing that such a problem exists, the advanced team has the power to make appropriate adjustments like readjusting workload, or reassigning functions, that allow all team members to function productively.

Compensating. Team Identity is strengthened by the process of compensating, the ability of team players to step outside of their assigned roles

or functions and perform different ones in order to help the team reach its goals. Back to our hockey team: each member is playing his role as the center moves the puck down the ice. Suddenly, the center is knocked down. Before you know it, another team member has moved in to cover his function. It could be a wing, it could be a defensive player who's out of position and just happens to be close by. But someone covers the gap.

As in our example, most teams have members who are either periodically or consistently unable to handle some of their functions. Teams operating at a basic level of Team Identity lack members who are able to put their own roles aside and help to fulfill these functions. Advanced teams we have watched set a tone that encourages members to step outside their roles in order to remedy the problems that other members are having with accomplishing their functions.

But it is not enough for team members to compensate when problems arise around a given role or function. In the teams we have watched, the advanced decision-making teams also try to learn what caused the problem. There are a wide range of reasons for the need to compensate:

- *Uneven distribution of workload so that one member has become overloaded*
- *Unexpected events that have pulled the team member's attention away from assigned work*
- *Unwise use of a member's expertise in designating roles or functions*

In these cases, advanced teams will even-out the workload, allocate the appropriate resources to deal with the sudden turn of events, or realign team responsibilities along expertise. Basic level teams often struggle with the status quo, feeling locked into appointed responsibilities. Advanced teams remain flexible, shuffling functions to improve not only their members' individual effectiveness but the team's overall decision-making effectiveness.

Using the compensating process to build stronger Team Identity also involves knowing who is likely to step forward when a new demand arises and who must hang back to cover the gap. Inexperienced teams often find themselves at one of two extremes: holding members rigidly to their assigned roles and functions to meet set expectations or tolerating members who free-lance when others are depending on them to carry out their assignments.

The entire team and not just the leader shares the responsibility for the identification of the reasons for and best ways to compensate. After all, the leader cannot be in all places at all times.

Moreover, some of the leader's functions may need to be covered as well. The advanced teams we have observed seem to realize that all of the functions, even the leader's, must be scrutinized to ensure that all functions are fulfilled.

Avoiding micromanagement. One key way that Team Identity is maintained is by avoiding micromanagement. Micromanagement occurs when team members manage information, tasks, or people at an inappropriate level of detail. It can divert teams from their goals, compromising the quality of their end products. For example, we once observed a large, multi-service team tasked with the complex goal of developing strategic plans to react to conflicts in two theaters simultaneously. The commander-in-chief (CINC) was unable to fulfill his oversight responsibilities at the higher level because he concerned himself with the tactics, not only helping to develop parts of the plans but giving all parts of the briefing himself. Unlike another, more advanced team we watched, the CINC did not ask his commanders to present their portion of the plan at the briefing. This meant he had to take up a great deal of his time being briefed by each of them so he could give the final briefing.

Basic level teams often fail to appreciate the damage to Team Identity which results when team members believe their leaders or managers are looking over their shoulders. The behavior often sets up a downward spiral, undermining the team by setting up:

- *Confusion about who is responsible for which tasks*
- *Duplication of other team members' functions*
- *Interference with another team member's work*
- *Compromise of the team members' investment in the team task*
- *Denial of self-direction and -responsibility*
- *Distraction from the assigned role and functions of the micromanager*

Understanding how damaging micromanagement can be to valuable team resources, advanced teams are primed to be aware of micromangement behaviors and take corrective action when they encounter them. Sometimes micromangement is caused by inexperienced or nervous leaders. Here, teams with a strong identity can often resolve the problem by simply discussing it, or the team can restructure some of the leader's functions to reduce the workload and overall nervousness. Other times micromanagement is a function of team members failing to provide feedback to others about the progress of their work. In this case increasing the frequency with which members exchange clarifying and confirming messages about work in process can help resolve the micromanagement problem. Problems with micro-management can also occur when team members ask for help and receive it

from a leader or manager instead of a more appropriate team member, one who does not have responsibilities at a higher management level. Advanced teams are quick to relieve the manager from this inappropriate role and assign it to a more appropriate member when this occurs. Basic level teams may not even notice that they have essentially become a leaderless team, with no one at the helm.

Team Conceptual Level

Team Conceptual Level captures the notion of a team as an intelligent entity, a "team mind" that thinks, solves problems, makes decisions, and takes actions collectively on a level of complexity and sophistication that matches the demands of the task.

To get a better idea of what we mean by a team's Conceptual Level, think of a company confronted with the challenge of incorporating a new division into the organization in order to extend their product line. While the potential this new product represents is very exciting, the company must also deal with many complex issues related to the addition of an entire new division. So they call a meeting where all the key players are present—the vice presidents: of strategic planning who maintains the company's growth plan; of finance who allocates the company's resources and tracks its profitability; of human resources who directs the staffing, compensation, and benefits for the company; of manufacturing who drives production and provides quality assurance mechanisms; of sales and marketing who takes the products to market and maintains customer satisfaction.

Like all teams, this one represents more experience, a greater knowledge base, and more diversity through its multiple members than any individual member would have alone. And drawing on this collective power of the team can lead to more creative solutions to problems, a richer assessment of the situation, and a greater ability to handle a wider range of factors during deliberation and contingency planning than what an individual can ever produce working alone.

However, it is difficult to handle the complexities of decision making as a team. Teams must expend effort to ensure that all their members share a similar understanding of goals, objectives, and situation assessment. In our example, the corporate team must put together a cohesive action plan based on a shared understanding of many variables and the alternative ways to handle them: will the new product require further R&D efforts? does the manufacturing of the new product involve an investment in new equipment and if so, how will the investment be funded? should the new division be managed and staffed with existing employees or does it require new technical expertise?

can the existing sales force handle selling of the new product or will it demand a dedicated sales force? how will the company inform existing customers, prospects, the industry, and general public about the new division and/or product or should the addition be non-transparent?

If teams fail to maintain a shared understanding, they are more vulnerable than individuals to the possibility of producing plans that are disjointed, poor in quality, or impossible to implement. Teams can also fall victim to conformity pressures: failing to challenge a prevailing view at the risk of making inferior decisions. Or, they may adopt a view which represents a compromise among competing viewpoints yet which the team does not actually support at all.

Teams can capitalize on the power of the collective status and sidestep the pitfalls described above by practicing the processes which promote high Conceptual Level:

- *Envisioning goals and plans*
- *Focusing on the time horizon and range of factors*
- *Detecting gaps and ambiguities*
- *Achieving situation assessment by diverging and converging*

Envisioning goals and plans. Teams that operate at a high Conceptual Level demonstrate the ability to articulate both the mission (goals) of the team and the process (plan) the team will use to achieve these goals. The process of envisioning goals and plans requires specific, concrete language, put into context relevant to the team members, both through examples that relate to their experience and through outcomes that contrast success and failure.

Most basic level teams we have observed fail to ensure that all team members have more than a minimal understanding at the outset about what the team is attempting to accomplish. In effect, these teams substitute an assumption that individual members share a similar understanding of the team's goal for the common understanding itself. Such an assumption can be fatal, especially if the team needs to break into sub-groups to develop various portions of the work. When the team then attempts to integrate the work of the sub-groups into a coordinated whole, they are likely to find differences that are irreconcilable in the time they have left to reach the goal.

Usually, the process of envisioning goals is the function of the leader. In military environments, the leaders of the more advanced decision-making teams we have seen provide clarity for the team's overall mission by:

- *Conveying a clear image of the desired outcomes*
- *Describing the outcomes that would count or fail to count as a success*
- *Providing a basis for determining priorities*
- *Presenting a clear image of how the team's mission fits into the larger picture*

Where the leader's envisioning is less clear, advanced teams will either request the clarification from the leader or develop it through team discussion. They ask for this clarification at the outset rather than wasting their time pursuing vague objectives.

As teams advance to higher conceptual levels, they not only ensure common understanding of goals at the outset of their work sessions but they are primed to clarify them throughout their work sessions. This is particularly important since it is not uncommon for teams to lose focus on agreed-upon goals or for goals to shift. Goals may change for several reasons. Even though the mission statement is relatively firm, the mission itself might include competing or shifting goals. Or goals might need to be refined or even altered as the team becomes more cognizant of what is actually achievable.

*In addition to envisioning its goals, the team must also determine the process they will use to meet their goals. Don't confuse these process plans with the kind of mission planning we've just discussed. There is a subtle but important difference between the "mission" plan—**what** the team will accomplish—and the "process" plan—**how** the team will approach the task. In our earlier example, the company's mission may be to provide a smooth transition for the new division and product by ensuring that the product is ready for market, allocating appropriate financial and human resources, determining the best vehicles for communication with the public, etc. Their process, on the other hand, might include who is going to define the various alternative approaches, when the team members will need to complete this information gathering, and how the final decisions are going to be made. The distinction is subtle but critically important, since, like our company, the mission of decision-making teams is frequently the development of plans.*

The responsibility for envisioning the process plan also usually falls to the leader. Less advanced teams often let themselves begin work without good direction about how to proceed and struggle too long before they admit their confusion. Their "process plan" is not a plan at all, just the act of "muddling through." In some settings, this "process" works; in many, the lack of an actual process derails a team.

But the opposite can also happen: teams can spend more time than is available detailing directions to a greater level of specificity than is likely

necessary to accomplish the team mission. The issue here is balance. Advanced teams are able to weigh the need for detailed direction against the time they have available to accomplish their mission. In cases where they are unsure about the appropriate level of detail and, are pressed for time, we have seen teams with a higher Conceptual Level establish checkpoints in the process plan, pre-determined times for reviewing the process to make certain that everyone has sufficient direction on how to proceed. Setting these checkpoints enables a team to begin taskwork, to "get going." Mental simulation—the process of visualizing where the team needs to be in their task by a particular time and what their work should look like by then—can be a useful tool in deciding where these checkpoints should fall in the process plan. Such simulation has helped the teams we've observed to avoid dangerous pitfalls:

- *Simplistic mission plans, the result of poor process planning*
- *Paralyzed teams, the result of teams too overwhelmed even to choose a starting point*
- *Failed deadlines, the result of teams bogged down in the process plan*

In addition to avoiding these pitfalls, the advanced team also periodically checks to see if the team is on course with its process. A clear and shared understanding of the process is especially important if the original plan doesn't work or in the face of emergencies allowing the team to improvise, create a modified or a wholly new plan, and still land on the targeted goal.

<u>Focusing on time horizon and range of factors</u>. Teams which operate at a high Conceptual Level also demonstrate the ability to focus their decision making within an appropriate span of time (time horizon) and on a relevant breadth of concepts and information (range of factors). Our company from the earlier example may have to develop their strategic marketing plan to introduce the new product within a month in order to preempt a competitor and simultaneously consider the wide range of potential economic impacts of adding a new division to the company. Further, this team would also need to look to the future—to anticipate the effects of this new product on their other divisions several years down the road.

Time horizon describes the focal distance at which a team is perceiving and reacting to the world, whether they see their task in terms of current or future events. The appropriate time horizon is a function of the mission and process plan of any given team. For a helicopter crew, the time horizon may be the cue that is just beyond the next visible navigation marker. For a Division planning team, it's more like 24 to 72 hours into the future, and for higher-level strategic planning teams, it could be 5 to 10 years into the future.

Establishing the appropriate focal point is a matter of balancing current and future events. Teams operating at a lower Conceptual Level typically focus too closely on the here and now, failing to maintain a focus that is far enough out on the time horizon. Advanced teams recognize and control for this tendency by concentrating on the final goal—and even beyond, to the consequences of the goal into the future. However, the opposite problem can occur as well. Teams can become so focused on the distant future that they fail to pay attention to current matters, resulting in short-run emergencies which concatenate into long-range disasters. To avoid being overtaken by the consequences of failing to consider early problems, advanced teams accommodate both the near and far time horizons.

As teams move from a low to high Conceptual Level, we have observed that they also become more effective at considering an appropriate range of factors in their decision making. This includes the sensitivity to a wider set of causal factors and to the allocation of its attentional resources so that different team members can capture and integrate different types of information.

During planning or situation assessment, teams we have watched usually suffered from too narrow a focus. It is common for teams at a lower Conceptual Level to concern themselves with only a sub-set of the total dynamics affecting a situation. For example, they might ignore non-military dimensions of a regional conflict such as diplomatic solutions or economic impacts. This typically happens when team members become too focused on generating sub-goals in planning or situation assessment and fail to assess their likely effects on each other or on the plan as a whole (i.e., first and second order effects.). Narrowing can also occur during execution when team members do not step back periodically to assess if their current status has evolved as expected, or if they are headed in the wrong direction.

But the opposite can also occur. Teams at a higher Conceptual Level are more successful than less advanced teams at recognizing when they are too broadly focused. When they are in danger of becoming paralyzed by trying to consider too many factors, they may simplify their analysis, break it down into more manageable components, or reduce the number of factors by collecting them into categories. If too many still remain, advanced teams prioritize their information so that the most important information receives attention before time runs out.

Detecting gaps and ambiguity. Teams operating at a higher Conceptual Level demonstrate the ability to discover and fill holes in the team's information base and assumptions and to recognize and handle inconsistencies or contradictions that might be present. We've observed many teams in

exercises where gaps and ambiguities are a result of the information given to team members as a function of their different roles on the team. Thus, the intelligence officer may have a completely different perspective than the political advisor.

Ambiguities are not necessarily problems for a team in and of themselves; in fact, they may even provide a source for the development of divergent views since they represent opportunities for discussion and clarification as the team works through them. The problem occurs when decision-making teams fail to detect or deal with these ambiguities. Gaps are harder to detect—it's easier to notice differing or ambiguous information than it is to realize something is missing. We have noted that teams which operate at a lower Conceptual Level:

- *Fail to seek out potentially important information that is not immediately available to them*

- *Ignore what's difficult to reconcile*

While these mechanisms for coping with information overload may temporarily reduce team frustration and threats to the team's time constraints, they are dangerous, compromising the ultimate quality of their team's work. There is no reason to believe that missing information is less important than what is readily available or that ambiguous information is unimportant. In fact, it is often the case that what you don't know can hurt you most.

Advanced teams actively attempt to detect gaps in information by scrutinizing what they've been given and by clarifying their assumptions about the information base. When gaps are detected, the team attempts to fill them rather than assuming they must continue to operate without this information. If the gaps cannot be filled, the missing information is noted, so that planning and decision making continue with this problem in mind.

Advanced teams may use mental simulation to search for gaps in a plan. As multiple team members visualize the information at hand with regards to the team's mission and process, gaps in the required steps, in their sequencing, or in their assumed consequences become more obvious. Sometimes these gaps are the function of an incomplete information base; sometimes gaps occur when the team has overlooked some logical steps in the process. Mental simulation can also uncover gaps in the way that various members understand the plan, providing the opportunity for clarification in order to reach a shared understanding.

In our experience, advanced teams are also primed to identify and reduce ambiguous information proactively, checking out quizzical expressions, for example, to determine whether the ambiguity is simply a misunderstanding or a genuine inconsistency. Basic level teams frequently fail to address even obvious potentials for misunderstandings. For example, they do not summarize key points following a lengthy description of a plan or of a situation assessment. Or, their members do not request clarification when they are vague in their understanding, unfortunately assuming it is reasonable to proceed with only limited awareness.

Less advanced teams also often ignore ambiguity due to inconsistencies, such as contradictory information, in the information base. Skilled teams attempt to decrease ambiguity by seeking more information, waiting for more of the situation to unfold, or reevaluating existing information. If ambiguity still remains, and deadlines are not threatened, teams at a high Conceptual Level maintain awareness of the ambiguity. They don't allow the team to become paralyzed by the ambiguity, but neither do they ignore it. If in time the ambiguity cannot be resolved, they incorporate it as a caveat or qualifier to likely success of plans and actions. Or, if the ambiguity is due to differing interpretations of the situation, advanced teams maintain awareness of these various plausible assessments in order to keep an appropriately complex picture of what might be going on.

Achieving situation assessment by diverging and converging. Teams operating on a high Conceptual Level actively seek a variety of views from team members about plausible situation assessments or plans. This process of seeking divergence can provide new insights into the decision-making process or uncover critical problems which must be considered before the team determines the final course of action. In one team we observed, for example, the CINC began a work session by polling each team member for his or her assessment of the situation. While explicitly polling each member exemplifies one important aspect of seeking divergent views, in this case it turned out that all team members saw things the same way. Thus, there really wasn't divergence in thinking about this situation. Rather than being overjoyed with the unanimity, the team decided they should take another 20 minutes to interpret the situation from the enemy's position. This exercise revealed a potential flaw in the assessment with dangerous ramifications for the success of the team's mission.

Unlike this team, the basic level teams we've observed often assume that the absence of voiced differences with a prevailing situation assessment or plan means that alternative interpretations of any significance do not exist. They accept the first plausible situation assessment that emerges, without a critical analysis of its potential for serving the team's mission. Then, they

plunge headfirst into the creation or execution of a plan based on an unexamined assessment.

Even when divergence is voiced, inexperienced teams sometimes fail to keep track of it. During situation assessment, it is not uncommon to find that alternative interpretations vanish from the team's mind when a narrow majority favors one interpretation of events. This is particularly unfortunate if it later becomes clear that the selected interpretation is wrong, for then the team is unable to substitute portions of the rejected perspective that could have been useful.

Advanced teams value the different experiences and perspectives of their members which are manifested in different assessments. These teams do not just tolerate different viewpoints; they explicitly seek divergence from their members to sharpen and deepen their situation assessments and plans of action. Teams operating at a high Conceptual Level encourage diversity rather than suppressing it as an unwanted complication. Their commitment to the process of seeking divergence is so strong that advanced teams play devil's advocate when they do not uncover divergent viewpoints, reviewing the expectancies contained within their situation assessment and evaluating them for consistency with incoming information or the projected future. We have observed that even under severe time pressure, advanced teams remain aware of other existing perspectives and temper their actions accordingly.

There is an obvious interaction between the strength of Team Identity and the team's ability to successfully seek divergence. On teams with weak identity, members are often hesitant to voice dissent or differing views. Teams can overcome this hesitancy, even before they have established strong identity, by voicing their expectation for members to seek out and offer divergent views and for their intention to monitor one another for this behavior.

But again, the issue is balance—balance between getting a variety of views on the table versus attaining agreement before time runs out. When teams spend too much time seeking divergence and are forced to give short shrift to the convergence process, they can wind up with:

- *False consensus on the accepted situation assessment*
- *Simplistic situation assessment*
- *Uneven understanding of the accepted situation assessment*

So, for example, even though the corporate vice presidents from our earlier scenario may have expressed their very different views at the new division/product strategy session, the president hastily summarizes what she

presumes constitutes the majority view as time begins to run out. Her assumption sets up a domino effect. Several vice presidents who disagree do not speak up, sensing the time pressure as well. The vice president of marketing agrees with the president in principle but believes her solution lacks the power to help them anticipate and then deal with some of the counter-measures their competitors are likely to take—issues that the team did discuss but left hanging. Now, those issues seem lost all together as he too decides not to verbalize his concerns in the interest of time.

Worse yet, this silence also prevents the team from knowing if everyone shares the same level of understanding about the accepted situation assessment, critical information for predicting teammate behavior when the inevitable unexpected problems occur. Compensating for those problems—making the necessary adjustments—will be near impossible, just as it is when a team lacks a shared understanding of its goals.

Teams operating at a high Conceptual Level demonstrate the ability to reach a shared understanding across all team members of a commonly held situation assessment. While the corporate vice presidents from our previous example came to the new division/product strategy session with very different expertise and priorities, they were able to work through their distinct perspectives to arrive at a group opinion.

The more advanced teams that we have observed ensure that all their members understand the situation assessment before generating or implementing the plans which will flow from it. They appear to differ from more basic ones in another important respect: they are less likely to be derailed by changing situations than basic level teams because they recognize the need to reassess the situation when information changes. They analyze whether these shifts call for modifications to their plans or actions in order to reach their overall goal and ensure that these shifts in situation assessment are understood by all team members.

Finally, advanced teams are better able to develop complex situation assessments in cases where complexity is warranted. They can use mental simulation, for example, to take the perspective of the opponent, imitating the way the opponent would construe their situation assessment and using the simulation as a means to evaluate its adequacy.

Team Self Monitoring

The model's components of Team Identity and Team Conceptual Level are states of being, qualities which describe the extent to which a team has achieved a more advanced team decision-making capability. We have

described the critical behaviors or processes that help teams further develop their capabilities in both of these components. The third component in the Advanced Team Decision Making Model is a process in itself—a regulatory process for all of the other processes we have discussed thus far. Self Monitoring is a master tool which helps teams promote advanced team decision making, moving from weak to strong Identity and from a low to high Conceptual Level by determining how successfully the team is using key behaviors. Team Self Monitoring by definition is the ability of a team to observe itself while acting within its tasks.

Just as teams vary in how well they use these Advanced Team Decision Making processes, teams can also differ in the effectiveness with which they monitor themselves for the use of the behaviors. While the very name of this component—Self Monitoring—could imply that this process is a function of individual team members, the "self" here is actually the team. The collective body takes on the responsibility for the process. We have observed that successful Team Self Monitoring is frequently a function of two of the most important diagnostic behaviors:

- *Adjusting*
- *Time management*

Adjusting. Adjusting is the ability to modify the way the team is performing when problems are discovered through the monitoring function. It is one thing, for example, to engage dutifully in the process of envisioning goals; it is quite another to sit back and assess whether all team members understand the goals clearly or to determine periodically if everyone is still headed in the same direction. As you've seen in our discussions of Team Self Identity and Team Conceptual Level, adjusting can be used to improve all of the Advanced Team Decision Making processes. Most significantly, the advanced decision making teams we've observed frequently and actively incorporate the adjusting process into their taskwork. They do this in an iterative fashion—watching, adjusting, watching again, adjusting again and so forth.

Advanced teams periodically step back from the taskwork to ask how well the team is doing. They consciously reflect on the processes they are using to accomplish their work. However, it is not enough for teams just to consider or even to alter their use of a process. When the advanced level teams we have observed determine the need for a corrective measure, they implement one and then reevaluate to see if it has solved the problem. We have also seen teams operating on a more basic level who discovered problems through Self Monitoring, decided on a corrective, and then stopped monitoring, failing to check out whether the corrective worked. Worse yet,

one team determined the need and approach for a corrective and then because of poor time management failed to implement it at all.

We can sum up in one word what a team develops when it exercises the process of adjusting: ***insight.*** *The act of watching the team for its performance on all the processes associated with Team Identity and Conceptual Level, and adjusting or changing its performance when problems are discovered is how insight is learned and team performance ultimately improved. Insight involves having a mental model about how the team should be operating—a mental model that includes a set of expectancies about what the team should look like and what it should be doing. The expectancies concern many things, but the most important ones are the processes associated with Team Identity and Conceptual Level.*

As the team practices its monitoring of these processes, it develops skills in knowing where to look. As the team tries to improve its use of the processes, it learns how to adjust. By making these changes and recursively monitoring their effects, teams learn how to become vigilant in Self Monitoring, and they confidently handle new challenges and requirements.

Time management. Time management is the ability to meet goals before deadlines overtake the team and to sequence sub-tasks effectively so that output from one task becomes timely input to the next one. Inexperienced teams frequently jump directly into a task without considering the amount of time they should allocate to each portion of their activities. The more advanced teams we've observed create schedules and work steadily towards their milestones. They check periodically to see if they are meeting these deadlines. And when their projections indicate that they will not be able to accomplish all the tasks they had originally planned, they re-prioritize so that the most important ones can be completed. They also keep all other team members informed about these changes.

Even teams with developed time management skills may fall victim to inconsistent monitoring of their schedules. They work steadily toward their deadlines, only to realize at the last minute that various portions of their deliberations or product just don't fit well, or that parts are missing altogether. Advanced teams often set up trigger-points to alert them to approaching deadlines and guard against the dangers of focusing entirely on the taskwork. Sometimes as a deadline approaches, a team finds that the general quality of their product is satisfactory, but realize too late that their work could have been vastly improved with only a little more time.

Protecting that last segment of a work period for review and final revisions is difficult in the midst of competing demands, but it is often what

distinguishes an excellent product from a mediocre one. Without this protection, teams lose their ability to monitor and manage their Team Identity or Conceptual Level, breaking down into a flurry of activity just prior to a deadline. The result is frequently work which comes frustratingly close to success, but doesn't quite hit the goal.

To avoid this last-minute breakdown, we have observed that more advanced teams build cushions into their time schedules, particularly when they are less experienced with the task at hand. They understand that unexpected additions to their tasks and unavoidable difficulties are more common in this scenario, and use that knowledge to gauge the size of the cushion they will need.

A Case Study

What follows is a case study of a decision-making team engaged in an exercise conducted at a senior service college. At the end of the case study, we analyze the team's performance from the perspective of the ATDM model and discuss those key behaviors from the model that are most definitive for this team.

The exercise scenario simulated a six-month period, compressed into three days of exercise sessions. The team's task was to develop alternative courses of action for the President to consider as the U.S. response to an unfolding situation.

The hypothetical situation concerns two real countries—however, the names have been changed here, as well as some of the background information. The scenario involves a potential threat to Moreva, an ally to the U.S., based on a developing situation which involves its neighbor to the west, Toldornia. The U.S. does not have diplomatic relations with Toldornia.

As the exercise begins, the situation is one of probable hostility between the two countries. The team knows the scenario can change at any time, and that they will be given updates about it as the exercise progresses. They also know that the alternatives they generate need to be consistent with political, economic, and military constraints and objectives described in their exercise materials. These are to be updated or changed periodically, as the situation evolves. Additionally, the team is to respond to diplomatic considerations from the international front which are under continuous flux as deliberations at the United Nations and various other multi-national organizations continue to evolve over the course of the crisis.

Background: *Toldornia has conducted a series of small-scale military exercises over the previous two years. These culminated in a large-scale mobilization and military exercise that has included the recent movement of sizable forces closer to a de-militarized zone that separates the two countries. (This zone had been established following a civil war 20 years earlier, which had resulted in the formation of the two countries.)*

Reliable intelligence indicates that Toldornia is planning to begin DMZ confrontations, and is prepared to go to war. The exercise materials explain that one plausible reason why these activities are taking place at this particular time is that Toldornia feels it is running out of time to negotiate reunification under terms favorable to them. This assumption is derived from the fact that Moreva has been experiencing increased social cohesion, due to greater democratization and economic development. Toldornia sees a window in which to fuel the reunification fires while taking advantage of Moreva's economy to solve their stagnating economy at home.

Both countries espouse an interest in reunification, but only if they can do so under conditions that meet their political and economic interests. The U.S. and its allies maintain a strategic interest in that portion of the globe, as does the coalition of governments that support Toldornia. Therefore, global involvement is expected if the two countries enter into a confrontation.

<u>The exercise</u>. The team consists of a commander-in-chief (CINC), several staff members—an assistant, a political advisor, an intelligence expert, a logistics specialist, and an operations specialist—and a commander from each of the services. As the session begins, the CINC is reminding everyone that they have all received their exercise instructions last week, ". . . in plenty of time to read everything. I'll just remind you that the materials include a mission statement, a schedule of when our alternatives are due each day, and background information about the situation that's relevant to your role. We've got a lot to do just a little time, so, if you have any questions, just look in your exercise booklet to find what you need—let's not bother each other about information we can find on our own."

"You all know I'm the CINC this time. I'll try to stay out of your hair—commanders, I'm sure you can do your jobs. Why don't you take a look at whatever you need to be worried about, given the material in your packets. I'll work with my staff here for a while."

As the two groups re-seat themselves into two clusters at opposite ends of a large room, one of the commanders and the political advisor remain in their previous places and begin reading through the materials—it appears they had not read them before. Both groups begin without these two people.

Within a few minutes, the rest of the CINC's group assemble, and two of the members begin a discussion. They throw out pieces of information about Moreva and Toldornia that were contained in the exercise materials. Several other members begin doing the same.

Some of the information appears contradictory—the team becomes increasingly confused. For nearly half an hour the members continue in this vein. Then, the assistant CINC observes that they all had a lot of material—"Just look at the stack of stuff we've all been given. We'll never get through it all this way." They all look to the CINC, who says he thinks most of their work has already been done for them—"There's a plausible description of the situation in our exercise material—why don't we just go with that as our starting point?"

They agree and begin bringing up information from their materials about events in both counties over the last two years that support that view. They do not return to any of the previously-mentioned contradictory information. They emphasize the recent military build-up near the DMZ and Toldornia's "now or never" attitude about taking drastic steps to hasten reunification.

The team's discussion then turns to speculation about just what Toldornia would do. Three of the members engage in the majority of the conversation. It takes a considerable amount of discussion, but they finally agree that it would be logical for Toldornia to begin with DMZ infractions, then to launch an all-out war against Moreva. They assume that Toldornia would move swiftly and forcefully against the capital, Yalkap, which lies close to the DMZ, since Yalkap is difficult to defend without loss of civilian life. Further they assume Toldornia could be successful in demanding reunification under terms that are more favorable to them than to Moreva, since Moreva would not want to risk wide-spread destruction within Yalkap. Last, the team reasons that even if Moreva does not initially agree to reunification, it is likely to lose Yalkap before it can establish a new defensible border, which would probably lie to the east of Yalkap and the existing border. Thus, they feel that Moreva will soon be faced with two bad choices: Accept reunification on unfavorable terms, or retain independence but lose Yalkap.

The team is now about one hour into their exercise session, which is scheduled to last three hours. The members of the other sub-group wander over to the ClNC's group, as had the two members who had been reading through their materials at the start of the exercise.

The CINC asks the commanders, "Have you figured out what you're likely to get?" (meaning, what air, land, and sea assets and forces they were counting on from the U.S., its allies, and Moreva).

The two commanders who had been working together say they figured that out within the first ten minutes—"We just put together a few of the lists and memos that were in our packets and came up with the combined forces and assets we could count on—you know—just in general terms. Like where they are, how long it'll take to get them in place, what their support requirements will be. We've been waiting for you to let us know what to do with them—to tell us what the types of responses are that we'll give to the President so we can work some feasibilities for you."

The Naval commander who had been reading during the time that these two were meeting says, "What about the naval forces?"

"We figured you'd plug in your information—your analysis—when you got done."

The intelligence officer asks if they have taken into account the possibility that Toldornia might use chemical weapons, and how that would affect the force structure they plan for.

"No, we didn't—that wasn't in our information. Was it in yours? We just got a look at what our maximum strength might be—we didn't look at special problems."

The political advisor asks, "Well, what about the problem that's brewing in the mid-central region—we may need to commit some forces there in the near future...did you factor that in? And there's that consideration about using our forces to transport and distribute food in the lower Lantrell region where the famine is spreading. You know how the Secretary of State is pushing us to change the image of our forces—that new idea of 'forces for peace'."

"No, that wasn't in our packet—we're waiting for some guidance about those sorts of things."

The CINC says, "OK, I can see we've been wasting some time here—let's get moving. Let's build some responses for the President." One of the ClNC's staff asks: "So what are we saying? That we expect Toldornia to initiate the hostility, and we want to be able to defend?"

The CINC replies, "Well, that could be one, but I think we're also saying we need to pre-empt that thinking on the part of Toldornia—that we need to have such a huge show of force that they won't even think of starting anything."

"How are we going to get world opinion in our favor for that? You know they said in that memo we can't count on international support for a move like that—you know, because of the potential oil embargo if our intentions are read wrong."

"Why would our intentions be read as anything other than they are? We can use our diplomatic routes to be sure our intentions are known. We'll get world opinion on our side, all right. They'll be just as scared of this situation as we are—they'll be looking to us to keep a lid on everything."

"I'm not so sure. There's been some recent history that might worry some of our allies, let alone the countries where we don't have strong relations."

"Well, we can't know about that, and we've got to get some responses together. Let's just assume we can convince everyone (of our intentions)—and if the President doesn't like that alternative, he doesn't have to go with it."

Another member says, "Yeah, but suppose we do start moving forces—Toldornia will know it. It'll be like lighting a fuse under them. Either we've got to figure a way to be more invisible, or cloak our intent with a convincing alternative explanation."

"Or else we've got to take the pressure off Toldornia—figure out another alternative for them besides attacking Moreva—give them a way to improve their situation short of the attack."

The conversation continues in this fashion for another 30 minutes. The CINC, who is becoming increasingly nervous, says they really must close off the discussion and produce some responses to give to the President.

Several members resist, saying they haven't even gotten to other issues that could impact on the responses they develop, but the majority of the team agrees that it is too late for more discussion and analysis.

In the remainder of the session, the team tries to produce three different responses for the President, based on a plausible assessment of the situation. All three responses are focused almost entirely on assumptions about the two countries; they take little notice of the many pressures from other portions of

the globe that could interact with the Toldornia situation, even though some of them had been brought up by team members earlier.

The CINC asks his assistant to record major points of agreement among team members as they hurriedly generate their three responses. The assistant does so, but not in public view. When the CINC eventually briefs the President's Chief of Staff (played by the instructor), his material is based on one team member's impression of the whole team's ideas, along with his own. After the briefing, several team members tell the CINC that his briefing did not capture the essence of several of their important discussions.

The Chief of Staff's reactions to the team's set of recommended responses include questions about:

1. *the long-range implications of each response they developed*

2. *contradictory information contained in their materials that could lead to interpretations besides the plausible one described in their exercise booklet—why hadn't the team considered several other scenarios and a response to each, rather than a single scenario with three different responses to it*

3. *conditions in other parts of the globe that could impact this situation*

4. *diplomatic as well as military responses to the situation*

5. *what led them to believe that they could count on international support for two of their responses, both of which would fail without it*

6. *the need to address the immediate threat of chemical warfare*

7. *a few geographic constraints that were not adequately addressed by the responses.*

<u>The team's after-action review session</u>. The team expressed frustration that several of the Chief's criticisms had come up during discussion, but had not been dealt with. Other members said a lot had come up, there was no way to deal with everything that came up, and they only knew by hindsight what turned out to be important.

Another member said "Hey, guys, that's the way things are in real life, too. We've got to get a better handle on how to anticipate things, how to incorporate more information and ideas."

"Yeah, that bit about geographic constraints was easy—we got most of them...I can't believe we missed those other few."

"I didn't miss them—don't you remember when we talked about them?....I thought you were going to go back over the responses and incorporate the changes we suggested."

"We talked about a lot of things...."

The CINC, who appeared both defensive and apologetic for the team's mediocre showing said, "Well, I think we can handle this assignment. I think we just have to do a better job of working as a team. We've got people here with a lot to offer—a lot of knowledge, a lot of experience. We missed the big picture here today—we got bogged down with too many ideas."

"But I thought we wanted to generate a lot of ideas and pick the best of them."

"Yeah, I know, but we need to think bigger with them. We could have come up with better responses if we had more time....or if we used it better. Tomorrow, let's work harder on coordination and teamwork. And, let's all come prepared having thought about the new material they'll give us for overnight reading."

"How are we going to handle all the information? We may have had a lot of ideas here today, but they sure didn't cover everything they needed to."

"Let's just try to watch for that and interject when we think the team is forgetting something. We're all experienced people here. I think we can handle this."

*<u>The analysis of the team</u>. **Overview:** The CINC's approach to the situation was to give the team a pep-talk. While he did put his finger on some of the problems—not looking at the big picture, getting bogged down with all their ideas and the need for better teamwork, neither he nor any of the team members worked towards specific changes they could make in the subsequent session.*

Sensitivity to problems is a necessary first step to solving them. But without a plan for addressing difficulties and helping people know what to do

differently the next time, chances for improvement are slim. Further, without knowing how to systematically diagnose the full range of problems, the team can miss several that can wind up derailing it.

Unfortunately, few teams happen to have members who are aware of the key behaviors that need monitoring and managing. Most teams ignore their decision-making processes altogether, or else they struggle with a haphazard review much like this team did. A more structured review session and systematic evaluation of key behaviors addressed by the Advanced Team Decision Making Model would have allowed the team to identify specific ways to improve. In the following sections, we provide a critique of the decision-making processes of the team presented in the case account. While the issues presented are ones that we would have addressed in a feedback session with this team, we typically would not deal with every process or every one in the amount of detail which follows. Even relatively advanced teams would be overwhelmed by so much information. For the instructional purposes of the case study, however, we wanted to discuss all relevant Team Identity and Team Conceptual Level processes to enhance the learning potential of the exercise. We examine all processes except for avoiding micromanagement, which wasn't an issue in this particular situation. We also offer ideas about how the team could have done things differently and suggestions for remedying some of the problems they encountered.

Envisioning goals and plans: *Envisioning goals and plans was essentially absent as a team process. The CINC began the session by stating his assumption that most information, including the mission statement, was contained in their exercise materials. It was as if he felt it would insult their intelligence and waste their time if he went over the obvious. And, no one from the team questioned whether it made sense to begin without this clarification. Nor did anyone ask for clarification during their work session.*

If the team had evaluated their use of that process during the review session, they would have discovered its absence. Most probably they would have resolved not to begin their subsequent session without having a better sense of what their goal was. They wouldn't have wasted as much time during their disjointed discussions if they had begun by envisioning what would count as a successful set of responses and maybe contrasting that to what an unsuccessful product would look like. For example, they needed to consider political as well as military responses to the problem. International support for the responses was also important. The need for a bigger picture would have emerged from this envisioning of the goal.

Also of major importance for this team was a process plan, and some time management of that plan. It's not as if the CINC was unaware of the

need to manage time—he did remind the team several times of the need to "get moving." But, a more detailed plan of how to approach the problem, and how much time to devote to various steps in the approach was needed.

If the team had taken the time to develop a process plan, they would most likely have realized that the commanders' team would need to meet for only a short while to discover maximum assets and forces. They could have been given other tasks, they could have rejoined the larger group sooner or they could have worked with staff members like the political advisor who had some information that they didn't—such as the threat of chemical weapons and the possible use of forces elsewhere.

More important, they could have laid out the steps they would need in order to generate the responses, estimating the amount of time it should take for each. Also, they could have set checkpoints where they would stop to evaluate whether they were still on course.

***Defining roles and functions:** The team got off to a poor start partly because the CINC assumed that team members had a firm grasp on how each others' roles and functions would work in this exercise. This was a risky assumption, and none of the other team members questioned it. While it is common in scenarios like this to divide tasks into command and staff functions, there is no reason to believe that team members would have an understanding of what particular tasks they would need to address, given this specific exercise and their assigned role in it. This assumption was not warranted, as evidenced by the commanders requiring only ten minutes to do what they thought was initially expected, and then waiting an hour before approaching the others to see where they were in their work as it might relate to their next task.*

Another indication of a poor start for this team was their lack of awareness of the perspective each person would be representing during decision making. The best teams we have watched have asked each member to briefly state how they interpret the information they have, or what information they are particularly sensitive to, given the perspective of a political advisor, for example. In this case, there would have been a big pay-off to this behavior. It would have aided in clarifying what kind of information any particular team member might expect from another, or who should be on the receiving end of some data analysis (the common pay-off). In addition, the team would also have been likely to discover that each person had some information that the others didn't—that it would be very important to get this information onto the table.

Compensating: A subtle yet powerful example of the need to compensate happened toward the end of the exercise. When the assistant CINC was asked to summarize and record the major points of agreement among team members, he did exactly what he was asked to do. But he was so locked into capturing the ideas, that he failed to present them to the rest of the team as he was summarizing them.

They had no opportunity to determine if he was capturing their thoughts as they intended them. An example of compensating would have been for another member to step outside his or her role to get some butcher block paper and write down the summary in full view of the team. Or, if none was available, someone could have requested the Assistant CINC to read each point as he complete it, to get the team's reaction to his wording.

Engaging: The political advisor and the Naval commander did not engage in the first hour of the collective task because they were not prepared—they needed to spend time reading through the materials. We have observed this in many teams and the behavior is usually ignored, as it was here. These members were lost resources to the team during the initial work period, and a message was sent that this was okay. A better approach would have been to ask how long they would need to get up to speed, and to figure out the best way to proceed without them until they could join in.

Second, having seen that this was a problem in the first work session, the CINC should have asked at the end of their review session if everyone would be able to come prepared the next day. Instead, he just told everyone to think about their overnight reading. Either he, or another team member should have asked if everyone would be able to do that. If not, they could have generated a plan to re-allocate some roles and functions on a temporary basis.

Detecting gaps: One of the early steps would have been to poll the team members for their understanding of the situation. Differences across members about their understanding would have alerted them to differences in the information provided to them in their exercise packets. The team appeared unaware that the political advisor and intelligence officer each had information that the others did not have. Even when the team discovered (by accident) that they had been given different sets of information, they did not then redirect the ongoing discussion to find out what the full range of factors was.

Nor did they keep track of what information the team was missing in order to later develop responses that were compatible with all of it. The step of evaluating their responses for this compatibility was entirely absent.

Detecting ambiguity: *Another problem with this team was their inability to deal with contradictory or ambiguous information. They became confused by it. Instead of explicitly exposing contradictions and ambiguities in the information base, they threw them into the discussion and then ignored them.*

Suppose the team had made a deliberate attempt to get the full range of factors out on the table before beginning to develop their situation assessment. Any contradictory or ambiguous information could have been noted, so they could try to resolve it. Likewise, they could have searched for gaps in the information base, and tried to fill them. Remaining gaps or ambiguity could then be noted so that caveats could be attached to their responses, describing them as feasible under specified interpretations of the data. Later, if the factors changed (the team had been forewarned that the situation would change over time), the team could adjust their responses accordingly.

This process would also have helped them focus on an appropriate time horizon. Some of the factors required them to deal with immediate concerns (was an invasion imminent?...were chemical weapons likely?), while others needed a longer view (what's the likely long-range implication of each response?). According to the Chief of Staff, their responses did not address either of these.

Seeking divergence: *The team was willing to surface and discuss differing opinions. However, these opinions were limited to small segments of the information. After they had explored the range of factors to be considered, the team could have sought a variety of different situation assessments and possible responses from its membership. Although one team member offered a creative response (i.e., helping Toldornia to improve their situation so aggression against Moreva didn't seem so attractive), the team didn't keep track of it or discuss it as a viable option. Later, when pressed for time, the team's memory for that response had vanished.*

In this case, the team created only a single assessment of the situation. Actually, they adopted an assessment provided in the exercise materials but ignored the fact that it was identified in the materials only as one possible view. When a single assessment is all the team can produce, one tactic it can use is to take on a devil's advocate role of challenging the assessment. For example, this team did a reasonable job of mentally simulating how Toldornia would attack Moreva. But, only three of the members engaged in that discussion. Some of the others could have challenged their reasoning during the simulation. This might have led to a realization that this particular scenario isn't necessarily the most likely one. Or, it could have led them to realize that while this scenario was consistent with the one suggested in the

The team neglected to evaluate whether members held a shared situation assessment and response. Rather, the Assistant CINC recorded his version of what the team was saying as it hurriedly tried to throw together the responses as their deadline approached. At a minimum, this should have been done in full view of the team so they could verify his summary, and so they could revise their decisions if necessary. Beyond that, a reasonable amount of time should have been set aside to discuss differences in situation assessments, and to develop one (or several) that the team agreed on, so that it could develop its responses.

The Training Program

This section describes the methods we used to incorporate a training program based on the ATDM model into the ICAF curriculum. The description of our methods is presented in accord with the following training program objectives.

1. To provide participants a conceptual framework for understanding Advanced Team Decision Making.

2. To offer students an opportunity to practice key ATDM behaviors and to subsequently evaluate their team's performance, thereby building ATDM skills.

3. To help students develop their observational and diagnostic skills via an evaluation tool which produces a concise, organized, and functional self-assessment of their team's decision-making processes, in terms of the 10 key behaviors of the ATDM model.

4. To help students sharpen their understanding of their team's decision-making performance by participating in (or leading) an after-action review; and to help students generate strategies to improve the team's decision-making behaviors based on the team's self-diagnosis.

The methods and materials used to achieve these objectives included:

- a lecture and booklet about the ATDM model
- an exercise
- a team self-evaluation survey
- an after-action review session

The lecture and booklet were used to help students understand the Advanced Team Decision Making model. The exercise provided them an opportunity to practice critical team decision-making behaviors. The survey and after-action review session were designed and conducted to help participants develop their observational, diagnostic, and team self-improvement skills, from the perspective of the ATDM model. The goal of the training

program was to improve participants' use of the 10 key behaviors of the ATDM model, thereby improving the team's decision making. A detailed description of each aspect of the training program is provided next.

Phase 1: The Lecture and Booklet

The first phase of the training program was designed to teach students about the specific components and key behaviors of the ATDM model. We introduced students to the ATDM model through a lecture delivered to the ICAF faculty and student body. All students and faculty members participating in ICAF's 1992-93 National Security Decision Making class attended the lecture. It lasted for two hours and concluded with a 15-minute question and answer period.

In addition to the lecture, we produced a booklet that offered detailed descriptions and examples of ATDM concepts and behaviors that impact team decision making. The booklet was distributed to students after the lecture and prior to the decision-making exercise. The booklet is attached as Appendix B and is excerpted on pages 17-44.

Phase 2: The Exercise

The second phase of the training program was designed to provide team members with an opportunity to practice key behaviors of ATDM, using an exercise specifically designed for this purpose. The complete exercise is contained in Appendix C.

In conjunction with ICAF faculty, we developed a realistic scenario about an issue that both impacts national security and corresponds to a topic the students would be studying in greater detail in an upcoming semester: education. The 1½-hour exercise required participants to develop strategy to support then-President Bush's education goals for the year 2000.

The program, called "America 2000: An Education Strategy," is based on President Bush's goal to return the U.S. to its previous position as an educational leader in the world community. At its core are six goals and broad strategies to be accomplished by the year 2000. Using these facts as a foundation, we developed the following exercise in collaboration with ICAF faculty.

The scenario is this: It is the final months of the 1992 Presidential election campaign, and President Bush's America 2000 program has been criticized by Democrats as lacking both a strong framework and the funding to support it. The Democrats also think it lacks the substance needed to return the U.S. to a position of educational preeminence. In addition to these criticisms, the National Education Association has recently endorsed Governor Clinton, who has been able to turn the occasion into a national media event. A televised debate has been scheduled to occur in ten days, and both Governor Clinton and President Bush are anticipating that education will be one of the key issues.

Governor Clinton has strengthened his candidacy considerably by identifying education as a top priority, and by making it a serious issue with the American voter. President Bush is growing concerned that education will be a pivotal issue that could cause him to lose a significant number of votes to Clinton. Of particular concern are two strategies that President Bush has gone on record as favoring, and which are becoming recognized as less popular with the American public than had previously been anticipated. These are the strategies of "choice" and "testing." Choice involves providing vouchers worth about $1,000 to parents so they can purchase their children's education from the school of their choice, whether public or private. Testing involves developing national tests that all students must pass, rather than relying on local schools to certify students' competencies.

In an effort to better prepare President Bush for the debate, the White House staff is seeking input from the National Defense University (NDU). The White House has asked NDU to respond to the following question: "How can the President of the United States convince the public that school choice and national testing are strategically compatible with the America 2000 goals?"

The White House has provided NDU with a recommended structure to address this question. They believe that a more comprehensive answer will be achieved if many different perspectives are represented during the discussion to answer this question. They are asking NDU to form groups consisting of a team leader plus eight people who will bring the following perspectives into a discussion about "choice" and "testing" to achieve the America 2000 goals:

- Business (from the perspective of the Department of Labor)
- Teachers (from the perspective of the National Education Association)
- Education Administrators (from the perspective of the National Association of School Administrators)
- U.S. Department of Education
- Congress (from the perspective of a recently released response to the Administration's proposed education legislation)
- Local government
- Citizen perspective: white collar, upwardly mobile, middle class
- Citizen perspective: unemployed, undereducated, community activist, public assistance recipient

Some of these perspectives oppose, and some favor, the strategies and goals proposed by President Bush. The reason for exposing these views during a decision-making session is that the developed responses to the question might be more acceptable to a larger portion of the American public.

In order to increase the fidelity of the exercise, we gathered information about each of the above constituencies and developed a one to three page perspective for each them. Some of the perspectives came directly from the agency they represented, others were a compilation of information we gathered from a variety of sources. Each perspective explained in some detail the stand taken by the respective constituency. Perspectives were given to students a week in advance of the exercise session with instructions which we paraphrase here: "In a 1½-hour 'burst' format (compressed time format) team members are to: (1) describe the relevant arguments contained in their assigned perspective (one perspective per team member, except the leader); (2) assume allegiance with their team (as opposed to independently role-playing their assigned perspective); and (3) produce a response to the President's question."

The product of the exercise was a briefing to a State Department representative who would in turn brief the President. However, the major purpose of the exercise was to give team members an opportunity to practice key ATDM behaviors while producing their response to the President.

Accompanying the ATDM booklet was a pocket-sized reference guide which lists the core components of Advanced Team Decision Making along with corresponding key behaviors. We intended for the card to serve as a reminder during the exercise of the concepts presented in both the lecture and the booklet. This card is included with the booklet in Appendix B.

Phase 3: The Team Self-Evaluation Survey

After teams finished the exercise and briefed a faculty member about their responses to the exercise question, an after-action review was conducted. Students were asked to think about how their team had functioned during the exercise. The objective was to help students develop their diagnostic skills by teaching them both where to focus their attention when reflecting on the team's performance, and also how to convert their observations into a concise, organized, and functional assessment of their team's decision-making processes. We developed a survey designed to facilitate the after-action review and to focus students' attention on the key behaviors of Advanced Team Decision Making.

Following a briefing to their instructor about their team's product, students completed a survey in which they rated their team's performance on each of the key behaviors of the ATDM model. Each survey item was stated in the positive, and team members used a 7-point scale to rate how fully they agreed with the statement. Table 2 shows a reproduction

of the survey. Labels in the right margin indicate which key behavior the statement refers to (student surveys did not include these labels).

During a break in the exercise/feedback session, team member responses were transferred to a summary matrix (see Figure 2) by placing a tick mark in the appropriate cell. The matrix was produced as an acetate slide, so it could be displayed to the whole team. It functioned as a "snap-shot" of how the whole team saw itself, and served as the focal point of the after-action review session.

Table 2

ATDM Participant Survey

Participant's Team Evaluation Survey
October 5-6, 1992

How much do you agree or disagree with each of the following statements? Please use this scale to rate your agreement with each statement:

7 = yes, I strongly agree
6 = yes, I agree moderately
5 = yes, I agree, but only slightly
4 = no opinion
3 = no, I disagree, but only slightly
2 = no, I disagree moderately
1 = no, I strongly disagree
NA = not applicable

	TEAM ID[1]
____1. We all accepted personal responsibility for the success of this team.	***Team ID, General***
____2. Everyone had a clear picture of each other's roles and functions, and how they related to achieving the team goal.	***Roles & Functions***
____3. If there was any special expertise in our team relevant to the task, we would have/did uncover it.	***Roles & Functions***
____4. The team operated as if each member was a needed resource.	***Engagement***
____5. We were able to draw quiet members into our discussion.	***Engagement***
____6. This team would have been able to/did compensate whenever the	***Compensation***

[1] Participant surveys did not include these labels.

need arose.

___7. We were able to deal with instances of micromanagement.	***Micromanagement***
	<u>MONITORING</u>
___8. There's nothing I can think of that could improve the way this team operated, given the task and conditions.	***Monitoring, General***
___9. Whenever there was a need to get us back on task, we didn't go too long before someone on the team reminded us to do it.	***Adjusting***
__10. We did a good job of sticking to our schedule and delivering our product by the deadline.	***Time Management***
	<u>CONCEPTUAL LEVEL</u>
__11. The quality of our product* was as good as it could be, given the time, knowledge, and resources available.	***Conceptual Level, General***
__12. From the beginning, we made sure that everyone had a pretty good idea of what would count as success, and what would count as a failure for our product.*	***Envisioning***
__13. Throughout the exercise, the whole team had a clear idea of	***Envisioning***
____ a. the team goal	
____ b. the process we would use to reach the goal	
__14. In developing our product,* we gave adequate attention to short-range issues to avoid their escalating to big problems later.	***Focus: T H Short***
__15. In our discussions concerning the product,* we were able to focus far enough into the future when we considered outcomes of our plans.	***Focus: T H Long***
__16. In developing our product,* this team's assessment of the situation covered a wide enough range of factors (for this exercise, the situation concerns education and the debate).	***Focus: R of F (not too narrow)***
__17. We developed ways to cope with a lot of ideas and information.	***Focus: R of F (handling the width)***
__18. The team tried to detect gaps and ambiguities in our facts and assumptions.	***Gaps & Ambiguities***
__19. We were able to keep track of ambiguous or conflicting ideas/ information until we could resolve them or use them as caveats for our product.	***Ambiguities***
__20. The team spent the right amount of time laying out the important issues/facts.	***Diverging***

__21. We actively sought differing views about the situation from all our members. ***Diverging***

__22. Whenever the discussion became complex or difficult to follow, someone attempted to summarize. ***Converging***

__23. The team converged at about the right time: not so late that fine-tuning of our product* wasn't possible, and not so soon that meaningful debate was closed off. ***Converging***

__24. In general, we were all attempting to use the Advanced Team Decision Making model in our teamwork. ***General***

__25. Team members were able to anticipate the needs of one another. ***General***

26. Considering everything, this team excelled on its ability to ***General***

____ a. Coordinate

____ b. Communicate

____ c. Cooperate

__27. Does anything else stand out about this team that should be identified? Please describe.

*product = response to the President

Question #	Rating: Strongly Agree 7	6	5	No Opinion 4	3	2	Strongly Disagree 1	Not Appl. 0
Team ID 1								
2								
3								
4								
5								
6								
7								
Total Team ID								
Monitoring 8								
9								
10								
Total Monitoring								
Conceptual 11								
12								
13a								
13b								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
Total Conceptual								

Accompanies: After-Action-Review Questionnaire
October 5-6, 1992
Revised October 16, 1992

Klein Associates Inc.

Figure 2. ATDM survey response matrix.

Phase 4: The After-Action Review Session

We had several objectives for the after-action review sessions. One was to sharpen students' understanding of the key team decision-making behaviors of the ATDM model through discussion of specific behaviors that their team produced, and which had served as the basis for members' ratings of their team on the survey. A second objective was to offer a forum for the team to devise improvement plans and strategies based on their self-diagnosis. A third objective was to help students develop their feedback skills by teaching them how to lead and participate in after-action reviews of team decision-making work sessions. By "feedback skills" we mean the ability to explicitly discuss the team's performance, so that adjustments can be planned for subsequent teamwork sessions.

Earlier in the semester, we prepared ICAF faculty members to lead the after-action review sessions following the America 2000 exercise and thus to serve as role models for students who would lead review sessions during succeeding exercises. We prepared faculty members by providing them with the same experiences through which they would be expected to lead their students later in the semester. This included (1) a 1½-hour session in which instructors worked as a team to complete the America 2000 exercise; (2) a 10-minute period in which they completed the after-action review survey; (3) a 30-minute after-action review session facilitated by our staff, in which instructors discussed their team's performance, based on the survey results; (4) a wrap-up discussion about how instructors should prepare their student team leaders to lead the America 2000 exercise, and how instructors would conduct the after-action review sessions.

Two weeks after this training, instructors were expected to guide their students through the ATDM training classes. The faculty members' responsibilities were to observe the team's processes during the America 2000 exercise and to facilitate discussion about how the team perceived itself during an after-action review session. Although there was natural variability across instructors in how they conducted these review sessions, the following describes common practices across all instructors.

The instructor began the session by returning each member's survey, so they could see how they rated the team on the survey items. He then displayed the acetate summary matrix of the members' ratings to the team, using an overhead projector. The instructor asked students to describe any patterns they could identify in this picture of how the team saw itself.

Possible patterns include:

(1) Similarity in overall rating for each of the three core components: how well the team thought it performed in the aggregate (across specific questions), for each of the three components of Team Identity, Team Conceptual Level, and Team Self Monitoring.

(2) Dispersion of ratings: how much variability there was across team members in the way they rated their team.

(3) Relation of product quality and team decision-making behaviors: the relationship between ratings on Question #11, which concerns the quality of their product, and other general patterns (i.e., was there more or less variability in responses to Question #11 than

the general amount of variability?; were the ratings for Question #11 higher or lower than for most other questions?).

(4) Similarity of ratings across survey questions: whether there were any outliers (i.e., questions whose response pattern was noticeably different from other items).

The instructor facilitated a discussion among team members about any patterns the team noticed. When there was agreement that the team was functioning well on any of the key behaviors of the model, discussion addressed the behaviors that contributed to this success. For instance, in one session, the team summary showed agreement that the team had a clear picture of each others' roles and functions, and how each related to achieving the team goal. The instructor asked the team to give an example to instantiate this rating. One member reported that he had rated it high because the team leader had asked each member to take a few minutes to summarize the perspective he or she was asked to represent, rather than jumping directly into the task. Others agreed with this reason. The instructor then probed for more examples of the team's behaviors that supported the generally high rating for this item. Several team members had additional examples. This provided an excellent opportunity for each student to gain familiarity with a number of behaviors constituting the key behavior in question, and to deepen their observational and diagnostic skills.

A second example concerns the key behavior of focusing on a wide range of factors, where most members of a particular team had given themselves a high rating on this item. In discussing their self-evaluation, the team discovered there were *several* specific things that happened--not just the single most obvious one—that had contributed to their advanced use of this key behavior.

At the beginning of the session, the team leader said: "We're here to get the pros and cons listed for choice and testing so we can pass it off to the President. Let's just go through each perspective and pull out each argument as it relates to each of the America 2000 goals. I'll write them down on the board--this will be our briefing." This generated a considerable number of items (range of factors), and was the behavior that most members described in the review session as contributing to their rating regarding range of factors. However, one member said that the process had seemed mechanical (although necessary) to him—that the real heart of the matter was what the team had achieved in the final 15 minutes of their work period: a broader look at the *implications* of these arguments, in terms of the political and economic difficulties the country was likely to face (both short-term and long-term) if these strategies were adopted. This discussion had generated an additional set of factors, and a much richer situation assessment than had been produced using the "list approach." And, he noted, the final discussion had only occurred because they finished their list before the deadline.

His point was that this final activity should have been planned from the beginning, or it might not have occurred at all. The list was really only a vehicle to drive the more important broad-based analysis. As a result of the discussion, the team recognized the value of this activity and acknowledged the need in the future not to leave it to chance.

For survey questions with a more variable response pattern (i.e., some members thought the team was doing well on this item, others thought the team was having trouble), the instructor would again ask members to describe some of the specific team behaviors or

vignettes they had in mind when they selected that rating for the team. This accomplished several important objectives:

(1) It highlighted differences in members' perceptions of specific behaviors that the team exhibited.

(2) By tying a key behavior from the model to a specific behavior (or set of behaviors) performed by the team, it sharpened the members' awareness and understanding of what constitutes a good versus a poor instantiation of a key behavior.

(3) It reinforced the need to explicitly engage in a review of the teamwork session in order to uncover problem areas that require adjustment, and to discover if the team as a whole is being perceived similarly by all its members.

For example, one team's self-ratings varied considerably on the item that asked whether the team operated as if each member was a needed resource. When the instructor asked if anyone could explain that rating, a very interesting discussion ensued. Some of the members reported not feeling a part of the team, while others felt as though some members were not contributing enough, and wanted them to be more active. They discovered that those members who hadn't contributed much felt the others' hadn't given them the opportunity. The rest of the team said the opportunity was the same for everyone and that "you just need to jump in there with your ideas." Finally, the team decided that since not everyone was likely to assert themselves, in order to get maximum engagement from all its members, they would do two things in subsequent sessions: (1) they would specifically call on quiet members periodically; (2) they would stop every once in a while in their deliberations and ask if everyone was comfortable with their level of involvement.

This example highlights one of the objectives of the review session: to facilitate a team discussion about specific strategies the team could use in subsequent teamwork sessions to adjust (improve) the way they were functioning. One of the viewgraph patterns that most easily led to that outcome was a low team self-rating by most members on a particular survey question. This is because ideas for adjustments naturally fell out of discussion of the problems the team was having. But, in cases where adjustment strategies didn't naturally develop, instructors were poised to help the team generate them.

A second vehicle for generating discussion about needed adjustments was the instructor's evaluation of the team's performance. For example, one team believed they had considered an adequate range of factors while discussing the perspectives in America 2000, but the instructor believed they focused on too narrow a set. The instructor identified these factors to the team, and facilitated their discussion of how they could have gotten more of the factors out on the table while still meeting their deadline. This gave the team a strategy for handling this same problem in subsequent work sessions.

Another team believed they had done a good job of self-monitoring, in general. When the instructor asked for examples of why they believed this, the members said they must have been doing well or they wouldn't have finished on time with most members contributing to what turned out to be a reasonably good product. The instructor pointed out several problems he had noticed. One of them was that they had not created a very helpful process plan. Among other things, it lacked a time schedule, so they easily could have

missed their deadline or been forced to hurry through their final activities. One team member responded that if they had seen they were running out of time, *then* they would have done something about it. The instructor asked how they would have known if they were allocating enough time to the most important tasks. No one could answer; point taken.

The foregoing allows only a glimpse at the richness of an effective review session. We found that one key to developing this richness was to continually request specific examples from team members that supported their survey rating. This usually generated comment from others, which promoted a deeper understanding of the 10 behaviors of Advanced Team Decision Making, and how their own behaviors relate to them. Another key was to limit the team's attention to the number of survey items that could reasonably be discussed in the allotted time, rather than rushing through too many items and generating a shallow evaluation of their team processes. This means there should be several review sessions as part of the training program, since in any one session the team can only address a subset of the total survey items and key behaviors. For our training program at ICAF, it was understood that in subsequent exercises teams would continue using the review session approach to which they were initially exposed following the America 2000 exercise.

A third key was to record the improvement strategies that the team generated, so they would have specific items to work on in subsequent sessions. This would be particularly important in lengthy exercises, such as the National Security Strategy Exercise, conducted at ICAF later that year. In that exercise, the team was expected to conduct several review sessions during the four-day exercise period. This iterative process of work session, review session, work session, review session etc., provided an ideal opportunity for team members to get immediate feedback about the effectiveness of the strategies they devised, and to refine and improve them in an iterative fashion.

A fourth key was to record or otherwise highlight successful behaviors that the team demonstrated, not just those that needed improvement. Research has shown that teams maximize those aspects of performance about which feedback is given, even at the expense of other aspects of performance (Salas, Dickinson, Converse, & Tannenbaum, 1993). Therefore, in order to promote continued use of effective team decision-making behaviors, it was critically important to make explicit to the team what it was doing well—what allowed it to expose ambiguous information, for example, or to create an excellent situation assessment. We found in our early studies that high performance teams were rarely able to tell us what made them so good. This means that mere exposure to their own best efforts did not provide them the information they would need to replicate this natural excellence in the future, when the tasks would be difficult or when they would be working with different team members. So we made it a point to design feedback sessions that included explication of teams' successful behaviors as well as those needing improvement.

A Study of the Model and Training Program

Testing the validity of a model, or the utility of a training program, is a large and a long-term task. It requires repeated testing with a variety of types of people, settings, and evaluation methods. Accordingly, we see the findings reported here as one facet of an initial effort to test the efficacy of ATDM for training decision-making teams. Although limited in scope, the ICAF data do provide promising empirical support for the utility and validity of

the ATDM model and the ICAF program. Specifically, our analyses addressed issues in four areas:

1. Validity of the core concepts of the ATDM model
2. Relation between the ATDM model and the teamwork literature
3. Impact of ATDM practice on teams' evaluation of their teamwork
4. Impact of ATDM practice on quality of team product

The data are based on responses to the 30-item After-Action Review (AAR) survey developed by Klein Associates to assess use of the ATDM model. The survey contains 23 items that represent key behaviors and basic components of the ATDM model; an item designed to audit whether the team was attempting to use the ATDM model during the exercise; an item that assessed perceived quality of the team's product; four items to represent teamwork dimensions derived from our search of relevant literature on teams; and an open-ended question that asked respondents to comment on aspects of the team not covered elsewhere in the survey. The survey was developed and refined during the Summer and Fall of 1992 as we were preparing the training program (i.e., lecture format, exercise materials, and feedback session design) for the ICAF curriculum.

The AAR survey had a dual purpose. First, it was a vehicle to prompt teams to practice ATDM behaviors, to become self-observant about their use of ATDM, and to diagnose their team's performance based on these observations. As described earlier, we used a team's survey responses during feedback sessions to foster discussion among team members about its performance on the 10 key behaviors, and to sharpen the self-monitoring and diagnosis skills that are part of advanced team decision making. In this sense, changes in survey results over time can be taken as an index of changes in the team's ability to "see" itself, and to diagnose its functioning. In addition, we wanted a reliable assessment instrument, one that would help us evaluate the impact of the ATDM model on teams' functioning.

Data Collection Methods

Data were collected during strategic-planning exercises held in October 1992 and January 1993 at ICAF. The same students participated in both exercises, so that they had multiple opportunities to review and receive feedback about their use of ATDM. Briefly, as described in the section about the training program, the October exercise—America 2000—was developed collaboratively by Klein Associates staff and ICAF faculty. In this exercise, students worked in teams of seven to eight participants. The exercise took 1½ hours to complete; students completed AAR surveys after the exercise and prior to briefing their instructors on their team's product. Then, they engaged in a review session covering the survey results (session length= 1¼ hours).

The second exercise, the National Security Strategy Exercise (NSSE), was a four-day exercise, and involved teams of 14 to 16 participants. It is conducted yearly, as an on-going part of the ICAF curriculum. Students completed ATDM surveys of their team decision-making performance at two points during the exercise: 1) the morning of Day 2, after completion of the teams' National Power Estimates and prior to briefing their team product to command staff—hereafter, "January 1" or "Time 1;" and 2) at the end of Day 2 or morning of Day 3, after the team had developed their National Intelligence Estimate—

hereafter, "January 2" or "Time 2." Review sessions similar to the one described earlier for America 2000 were conducted at each of these times, and were facilitated in most cases by the instructor. In some cases, they were conducted by the team leader, if the instructor felt confident that the leader had learned how to facilitate them and could generate good discussion.

Although the same students participated in both exercises, the ATDM survey was not administered to all teams during the NSSE in January, owing to constraints outside our control. In all, we obtained survey data for 21 teams in October, eight teams in January for the first survey, nine teams in January for the second survey. Of these January teams, seven of them provided us with survey data from both January administrations of the survey.

Questions and Issues

A set of four separate but related questions guided our analysis of the ICAF AAR survey data. As summarized earlier, they are:

- **Validity of the Core Concepts of the ATDM Model**—Is there support for the notion that each of the three core concepts in the ATDM model are single factors that tie together performance on their respective key behaviors; and, are core components stable over both time and repeated opportunities to learn about and practice ATDM behaviors?

- **Relation to Teamwork Literature**—How is ATDM related to dimensions generally thought to characterize differences between good and poor teams, such as anticipation, coordination, communication, and cooperation?

- **Impact of ATDM Practice on Teams' Self-Evaluation**— Does the team's view of its planning and decision making change in response to ATDM training opportunities?

- **Impact of ATDM Practice on Quality of Team Product**— Does the opportunity to practice and learn ATDM skills have an impact on the quality of the team's product?

Validity of the AAR Survey

As an initial check on the validity of the survey data, we examined responses to the following survey question: "In general, we were all attempting to use the ATDM model in our teamwork." If a majority of respondents indicated that their teams had not even tried to implement ATDM, then responses to the rest of the survey items would seem to be of limited value.

Possible responses ranged from 7 to 1, with anchors labeled as "yes, I strongly agree" (7) and "no, I strongly disagree" (1) (refer to pp 48-50 for a reproduction of the survey). Over the three administrations of the survey, respondents indicated that in general, teams were attempting to use the ATDM model. Mean ratings in October = 5.6, January 1 = 5.6 and January 2 = 5.5; the percentages of respondents who indicated some level of agreement

with the statement were 92%, 92%, and 89% in October, January 1, and January 2, respectively.

Based on these findings, we could proceed with confidence both that people were using the exercises to learn how to apply ATDM and also to better understand the model; and that we had preliminary evidence to support the face validity of responses to survey items.

A second check on the validity of the survey concerned the comprehensiveness of the questions as a means to assess the teams' decision-making performance. The last question is open ended; "Does anything else stand out about this team that should be identified? Please describe." Examination of responses to this question revealed that none of them concerned additional "key behaviors." Excluding those comments about the exercise itself, or about liking or disliking the leader, either the comments concerned global constructs like "cooperation" or "communication," or they were re-statements of key behaviors, like: "time was a factor" (time management); "we were supposed to work as a team" (team identity); "the team concentrated too much on the past and not on the future" (focus on time horizon); "some lack of focus on the goal of the team" (envisioning goals); "breadth of outlook was outstanding" (focus on range of factors); "trying to understand others' viewpoint, and then trying to work it into the solution" (situation assessment: seeking divergence and convergence). Virtually all of the key behaviors were mentioned in responses to this question. No new key behaviors emerged.

This finding is consistent with results from the AFIT study described earlier. It indicates that the model is comprehensive in its depiction of key behaviors related to team decision-making performance.

A variety of analytic methods were used to address the four bulleted issues described above. They include factor analysis, multiple regression analysis, and MANOVA; unless noted otherwise, each analysis was conducted separately for data gathered in October, January 1, and January 2. In the sections that follow, we briefly describe our data analysis methods, and present findings relevant to the four major topics outlined above.

- **Validity of Core Concepts**—The AAR survey includes 23 questions designed to assess team functioning on the 10 key ATDM behaviors: seven items address the key behaviors that comprise Team Identity; three items address the key behaviors that comprise Team Self Monitoring; 13 items address the key behaviors that comprise Team Conceptual Level. Our question was: Do these survey items constitute discrete, stable sets of measures that reflect the basic components posed by the ATDM model (i.e., Team Identity, Team Self Monitoring, and Team Conceptual Level)?

Factor analysis is a data summary and reduction method that allows one to identify and examine underlying dimensions common to a particular set of measures. When survey questions identified a priori as representing a particular dimension are found to comprise a single statistically significant factor, support for that aspect of the model is indicated. And to the extent that factor structures appear to be consistent over time and assessments, the stability of the model also would be indicated. By "stability" we mean that repeated exposures to the model during review sessions, and repeated attempts by teams to diagnose

their performance, did not lead to a conceptual disintegration in the minds of participants about the model's basic components of Team Identity, Self Monitoring or Conceptual Level.

We conducted a series of factor analyses, using maximum likelihood solutions, and allowed the analysis to indicate the number of factors that best accounted for interdependencies among variables in each set of survey items. Although an exact quantitative basis for factor selection has not been developed, among the most common criteria is size of the eigenvalue associated with each factor extracted from the overall set of values. Factors with eigenvalues exceeding 1.00 are typically treated as significant, while factors with eigenvalues less than 1.00 are disregarded.

Using an eigenvalue cut-off of 1.00, we found that in every instance except one, the key behaviors posited by the ATDM model to comprise Team Identify, Self Monitoring, and Conceptual Level were represented by single, significant factors. Moreover, this was the case at all three assessments. The single exception occurred in the factor analysis of Team Conceptual Level key behaviors at January, Time 1. In this one case, the survey items yielded two significant factors, one comprised of envisioning goals and plans, and the other containing virtually all other Conceptual Level key behaviors.

The factor analysis results provided statistically significant, confirmatory evidence in support of the ATDM model; the fact that the findings replicate over time and repeated testings offer important, initial evidence of the model's stability. The single disconfirmatory result noted above has little bearing on our current conclusions, but it is something we will watch in future studies. It may be that different conceptual tasks are involved in envisioning goals and outcomes verses the diagnostic, information-gathering, and assessment tasks that constitute the other Conceptual Level behaviors. Whether the factors represent subordinate aspects of Conceptual Level, and indicate the need to revise the model, warrants additional examination.

An additional product of the factor analysis was sets of factor scores, in accord with the factor structures obtained, for use in subsequent analyses which we describe below.

- **Relation to Teamwork Literature**—As we noted previously, the teamwork research literature offers a number of models and conceptual frameworks intended to describe teamwork. In our review of this literature, we identified several frequently mentioned dimensions that appear to be related to decision making. They are: anticipation, coordination, communication, and cooperation. These dimensions are somewhat abstract, since they require numerous observable behaviors to specify what is meant. Our purpose in developing the ATDM model was not to create yet another summary model from the array of those available. Rather, our goal was to identity those dimensions that appeared most relevant to team decision making and problem solving from our observations of experienced teams, and to state them in terms of directly observable behavioral markers. To the extent we were successful in doing so, we would expect the 10 key ATDM behaviors to be associated with the more global, or abstract, teamwork dimensions from the literature, and for those associations to be consistently positive. Similarly, we would expect the three basic components of the ATDM model to be positively related to these global teamwork dimensions.

We examined correlations between the ATDM survey questions and the four global teamwork survey items. Although the global variables are typically treated as representing distinctly different aspects of teamwork, that conclusion may not be warranted. Associations among responses to survey items about these global dimensions of anticipation, coordination, communication, and cooperation indicate redundancy across the dimensions, at least as measured by the AAR survey. In October, average $\underline{r} = 0.72$ (range: 0.61 - 0.84); in January 1, average $\underline{r} = 0.70$ (range: 0.62 - 0.78); and in January 2, average $\underline{r} = 0.75$ (range 0.72 - 0.82). Based on these findings, we would suggest caution in treating these global dimensions as independent aspects of teamwork.

Correlations averaged over the three assessments, and across survey items that represent a given key ATDM behavior are presented in Table 3.

A second index of the relation between ATDM core components and the global teamwork dimensions involved a series of multiple regressions, using scores generated for the factors of Team Identity, Team Self Monitoring, and Conceptual Level. These factor scores were calculated as a data-reduction step. Separate regressions of the scores for these factors on survey responses for anticipation, coordination, communication, and cooperation items were carried out at each assessment time. The multiple Rs and R^2s from the analyses are presented in Table 4. All regression models were significant at $p < .05$, or better.

Both sets of data—those associated with the ATDM key behaviors and the ATDM core components—offer evidence that the ATDM model has significant points of contact with the global teamwork constructs so often used in the teamwork literature. The difference is that the ATDM model specifies the particular behaviors that comprise its core components, and that are key elements to effective decision making by teams.

Table 3

Correlations of ATDM Behaviors and Teamwork Dimensions: Averages and Ranges

	Dimensions			
Behaviors:	Anticipate	Coordinate	Communicate	Cooperate
Team ID				
Roles & Functions				
average r	.46	.48	.50	.50
range	.36-.57	.35-.57	.34-.58	.41-.62
Engagement				
average r	.50	.43	.44	.48
range	.30-.66	.27-.66	.32-.65	.32-.59
Compensate				
average r	.57	.61	.57	.50
range	.50-.60	.55-.67	.52-.60	.42-.60
Micromanage				
average r	.51	.44	.40	.39
range	.40-.58	.33-.58	.24-.49	.28-.48
Self Monitoring				
Monitor				
average r	.56	.53	.48	.53
range	.47-.63	.49-.59	.45-.52	.50-.57
Adjust				
average r	.36	.34	.35	.32
range	.28-.52	.25-.48	.26-.48	.21-.47
Time Management				
average r	.34	.45	.37	.37
range	.28-.44	.33-.53	.29-.47	.28-.51

Table 3 continued

	Anticipate	Coordinate	Communicate	Cooperate
Conceptual Level				
Envisioning				
average r	.47	.54	.56	.53
range	.39-.57	.26-.68	.36-.68	.34-.65
Focus TH - short				
average r	.52	.57	.54	.48
range	.43-.63	.51-.67	.48-.62	.40-.54
Focus TH - long				
average r	.56	.54	.56	.52
range	.46-.63	.43-.68	.54-.58	.47-.57
Focus R or F -				
narrow				
average r	.52	.50	.55	.50
range	.40-.64	.41-.60	.49-.58	.45-.55
width				
average r	.60	.63	.60	.61
range	.57-.63	.61-.66	.53-.64	.44-.70
Gaps & Ambiguities				
average r	.57	.55	.56	.49
range	.46-.69	.47-.62	.52-.61	.46-.56
Diverge				
average r	.56	.52	.50	.49
range	.41-.70	.38-.64	.41-.61	.37-.59
Converge				
average r	.57	.58	.54	.60
range	.52-.63	.31-.69	.31-.62	.35-.77

Table 4

R and R^2 Values Resulting from the Regression of Factors Scores for Team Identity, Team Self Monitoring, and Conceptual Level on Survey Scores for Anticipation, Coordination, Communication, and Cooperation.

	R/ R^2 / October	R/ R^2 / January1	R /R^2 / January2
Anticipate	0.61 / 0.38	0.82 / 0.67	0.80 / 0.63
Coordinate	0.74 / 0.54	0.69 / 0.48	0.82 / 0.68
Communicate	0.72 / 0.52	0.73 / 0.53	0.72 / 0.52
Cooperate	0.73 / 0.54	0.73 / 0.53	0.72 / 0.52

●**Impact of ATDM practice on teams' self evaluations.** One of the major elements of this project is the issue of training. Would teams begin to alter their decision-making behaviors with opportunities to practice and learn Advanced Team Decision Making? Would the opportunity to use the model in strategic-planning exercises alter the team's view of its own processes? Evaluation of behavioral change requires repeated measurement on the same individuals, and we were fortunate to have 109 participants, on seven teams, for whom we had individual survey responses at both January 1 and 2.

Repeated measures MANOVA was used to analyze data relevant to training effects. MANOVA allows one to examine the effects of one or more independent variables on a set of dependent measures. We performed a mixed design MANOVA using the seven teams on which we had complete data for individual Ss. The MANOVA design employed Team (n=7) as a between-Ss factor, and Time (n=2) and Question (n=24) as within-Ss factors. Note that Time 1 = January 1; Time 2 = January 2. The analysis allowed us to examine overall effects of Team and Time on ATDM evaluations (i.e., Question).

The 3-way interaction of Team, Time, and Question was not significant [F (138, 1, 978) = 1.19, MSe = .65, $p < .08$]. Inspection of the means revealed that, as expected, there were no reliable patterns in the way teams rated themselves over Time and Question. We would not expect that, across all teams, particular patterns of change over two time periods would appear for all or most of the survey questions.

However, all three of the 2-way interactions were significant. Taken together, they form a coherent pattern of findings that supports the value of repeated practice with the ATDM model. Following is a brief description of the separate interaction effects, and interpretation of the findings when considered together.

TEAM X TIME—The significant interaction of these factors indicates that survey responses at Time 1 versus Time 2 varied across teams [F (6,86) = 3.53, MSe = 15.93,

$p < .004$]. Inspection of Figure 3 shows that for most teams, ratings declined at Time 2, and that the amount of decline varied across teams.

TEAM X QUESTION—As depicted in Figure 4, this finding indicates that teams differed from one another in their patterns of responses to individual questions [F (138, 1978) = 1.44, MSe = 1.32, $p < .001$].

TIME X QUESTION—This finding indicates that collapsing across all teams, the pattern of responses to questions at Time 1 differed significantly from the pattern than at Time 2 [F (23, 1978) = 2.58, MSe = 1.42, $p < .0001$]. Inspection of Figure 5 shows that for many questions, ratings were lower at Time 2 than at Time 1.

As can be seen in these three figures, patterns of increase and decrease across questions varied from team to team. On only two questions did ALL teams evidence a consistent response—a decrease from Time 1 to Time 2. To the extent that survey responses reflect variations in teams' experience, performance, process, and decision making, one would expect to see differing patterns of response to individual questions across the teams.

Examination of means and standard deviations associated with these three figures shows that although mean ratings generally declined from the first to the second test, this was clearly not the case for some teams, or for some questions. One index of the directionality of change from Time 1 to Time 2 is provided by the percent of questions on which teams evaluated themselves as **the same or better** at Time 2 than at Time 1 (see Table 5).

In addition, it appears that teams at Time 2 were more differentiated, and their survey responses more distinctive than at Time 1. Univariate tests of team responses on individual survey items at Time 1 and 2 revealed few significant differences among teams on individual questions at Time 1. Only two questions (both related to Team Identity) achieved conventional levels of significance ($p < .02$ in both cases). But at January 2, 15 of the 23 ATDM survey items, or 65%, showed significant differences across teams (p levels ranged from $p < .04$ to $p < .0001$). Moreover, these significant results represent key behaviors and core components across the ATDM model.

The fact that teams differed significantly on many more questions at Time 2 than at Time 1 suggests that team members were becoming more aware of ATDM behaviors and more discriminating in their evaluations of their own team decision making. Their responses to the evaluation instrument reflect a growing understanding and use of ATDM.

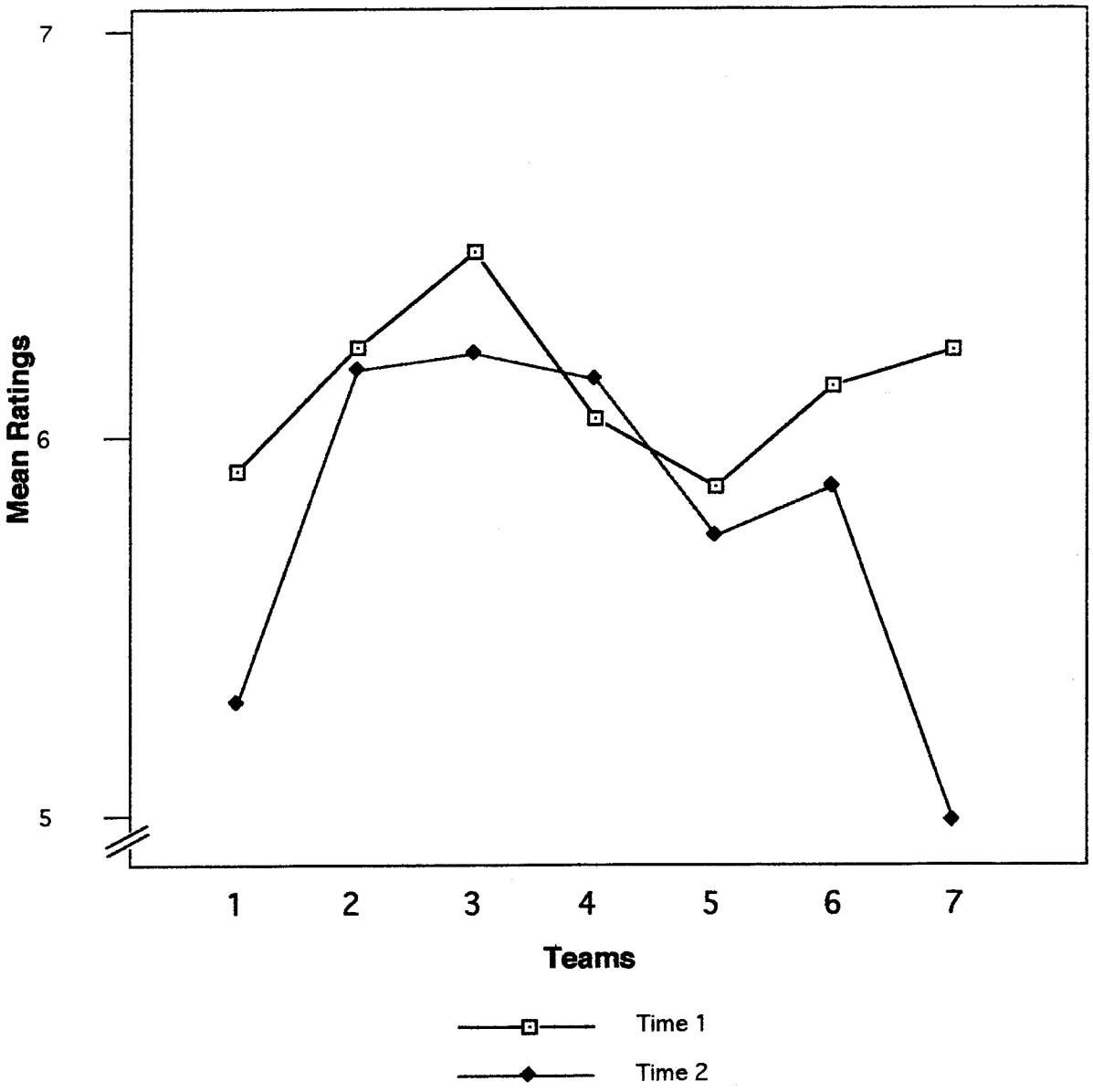

Figure 3. Mean survey ratings across team members for each of seven teams at Time 1 and Time 2.

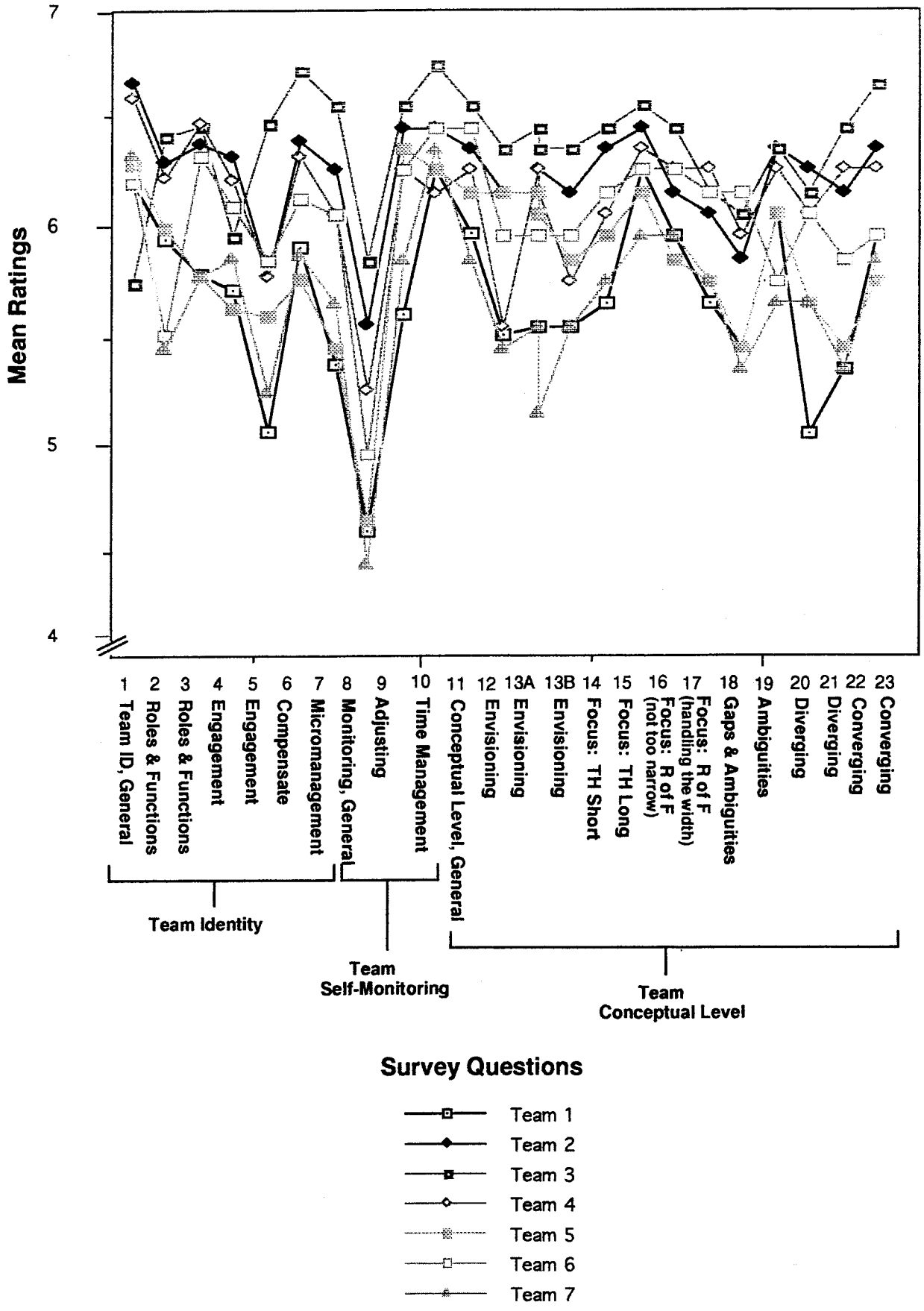

Figure 4. Mean survey responses across team members for each of seven teams for each survey question.

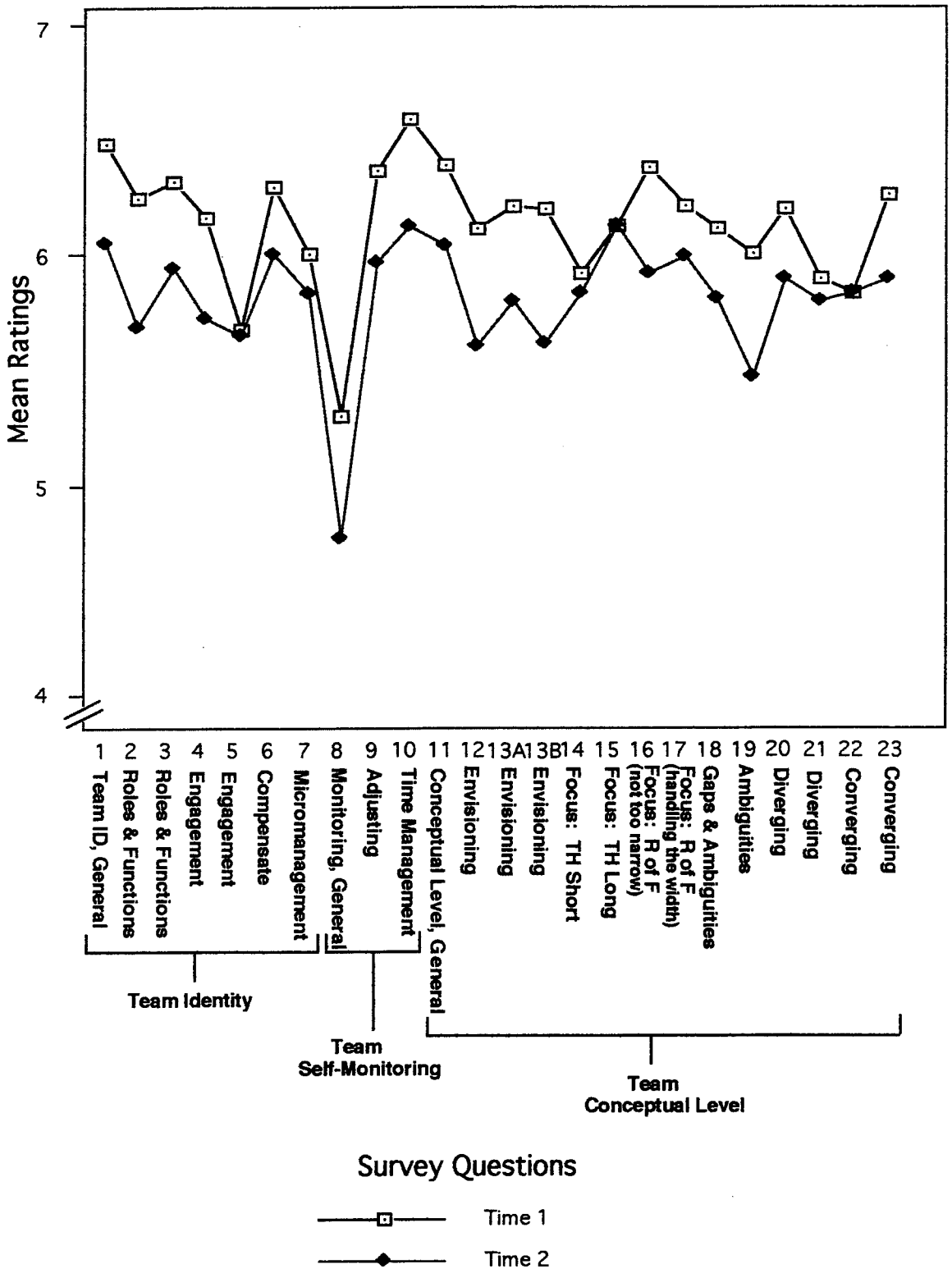

Figure 5. Mean survey ratings across team members for each of seven teams, at Time 1 and Time 2 for each survey question.

Table 5

Percent of Survey Questions on which Teams Rated Themselves the Same or Better at Time 2 Compared to Time 1

Team #1	58%
Team #2	0%
Team #3	8%
Team #4	33%
Team #5	62%
Team #6	21%
Team #7	25%

To complete this discussion of the MANOVA results, following is a description of the main effects. The presence of these significant two-way interactions affects the interpretation we may apply to each of the two significant main effects, which are as follows:

TIME—The significant main effect of time (i.e., test repetition) [F (1, 86) = 22.47, MSe = 102.21, p<.0001] indicates that across teams and individual questions, responses at Time 2 were significantly different from those at Time 1. Overall, the mean response at Time 2 was **lower** than at Time 1 (Time 1 X = 6.1; Time 2 X = 5.7). However, the interactions of TEAM X TIME and QUESTION X TIME indicate that this general pattern does not hold for every question and for every team.

QUESTION—[F (23, 1978) = 14.85, MSe = 13.68, p<.0001]—The significant main effect of Question indicates that across teams and testing, responses to survey items differed. The finding argues against the presence of a response set—the possibility that students didn't care about filling out the survey and simply marked responses at random or chose a scale value and used it throughout. While on face value one would expect this, the finding can be seen as offering support for the contention that survey responses were thoughtfully and meaningfully reported.

The presence of a 2-way interaction between Question and Time indicates that the general response of lower ratings for questions at Time 2 versus Time 1 did not hold for every question, as discussed above. Likewise, the interaction of TEAM X QUESTION indicates that this pattern does not hold for every team.

TEAM—Given the two significant interactions involving team, the absence of a significant main effect still could require interpretation. (For example, a main effect can be

"washed out" statistically, but be present none-the-less if the effect of a second variable is roughly equivalent in strength but different in direction at each level of the first variable). However, inspection of means indicated no consistent variation across teams at different levels of time, or across different questions.

• **Impact of ATDM Practice on Team Performance**—Ultimately, the validity of any cognitive model rests on demonstration of its impact on relevant behavior. We developed the ATDM model to describe the decision making of highly functioning teams. Given this, we expect the use of ATDM to be reflected in the quality of decision outcomes and associated products. The AAR survey included one item designed to provide a measure of performance outcome, albeit a subjective one. The question was: "The quality of our product was as good as it could be, given the time, knowledge, and resources available."

We had hoped to also collect objective assessments of the teams' product from ICAF course instructors. However, these assessments were not produced by the instructors. Therefore the findings represent team members' perceptions regarding their own team's processes and products.

To examine the relation between team performance on the ATDM behaviors and perceived quality of the team's product, we performed two analyses. The first was intended to provide a picture of change that occurred over practice opportunities in this relationship. We produced correlations of ratings on each survey question to ratings on Question 11 (which asks members to assess the quality of their team product), for the October, January 1, and January 2 administrations of the survey. These correlations are depicted in Figure 6. This figure reveals that with repeated practice, teams find a stronger relationship between the quality of their team's product and the quality of their performance on the ATDM behaviors.

We then performed a series of multiple regression analyses, using factor scores for the Team Identity, Self Monitoring, and Conceptual Level factors regressed on ratings of the quality of the team's product. Results are presented in Table 6.

Overall, the results indicate that the ATDM behaviors are significant predictors of the perceived quality of the team product. Over time and opportunities to use and observe ATDM, the strength of the association grows (indexed by R^2), while the variability around it declines (indexed by the standard error). One interpretation of this finding is that participants were developing a clearer understanding of the link between the ATDM model and team performance, and that across members of any particular team, participants were developing a more consistent, shared view of that link. Use of ATDM concepts predicted quality of team products, and the relationship strengthened with opportunities for teams to use and develop their ATDM skills.

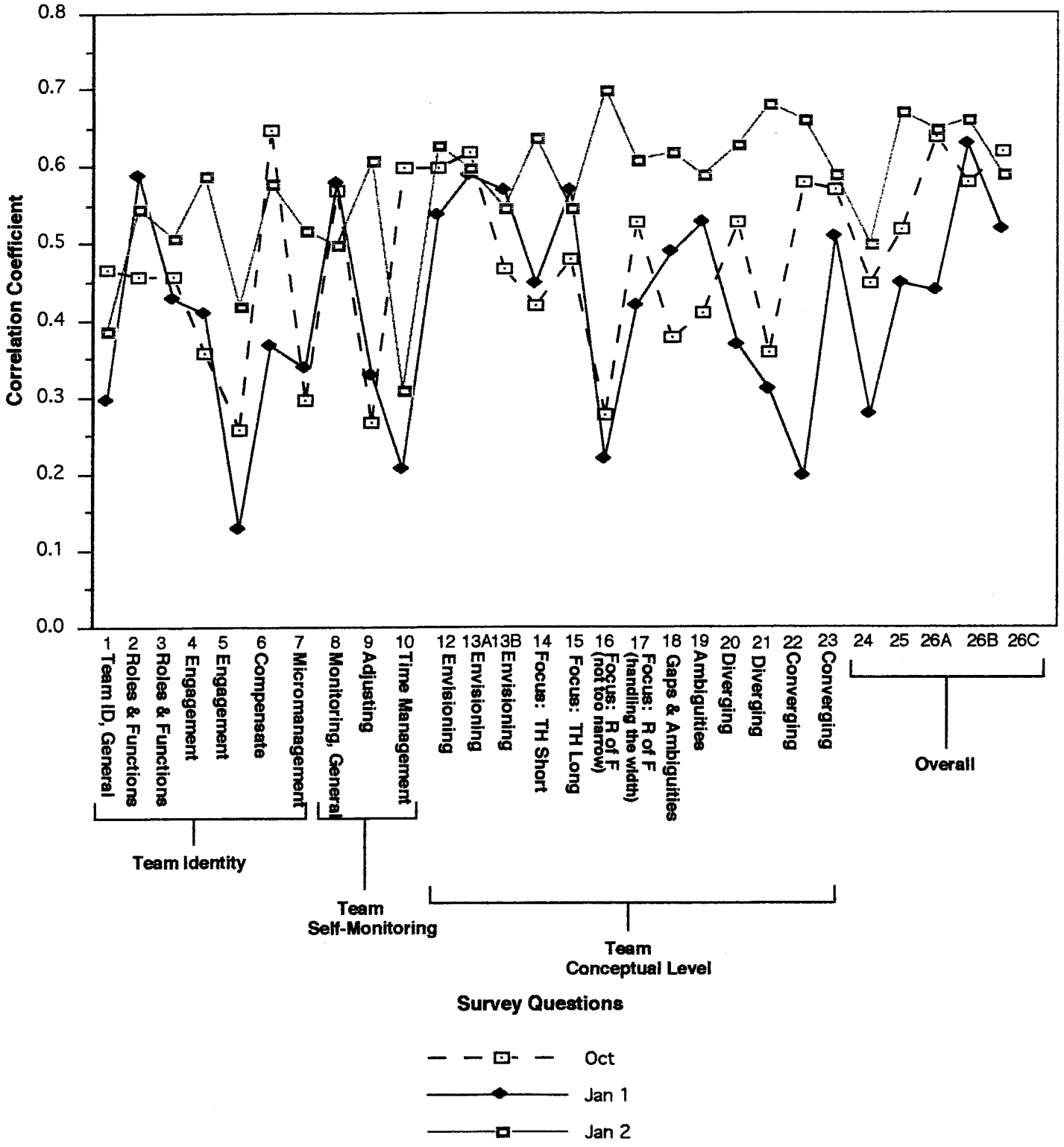

Figure 6. Correlation of ratings on Question 11 (quality of team product) to other survey questions, at each of three survey administrations.

Table 6

Regression of Ratings for ATDM Core Concepts on Team Performance Rating

	R	R^2	Standard Error	F	p
October	0.76	0.57	0.90	64.98	$p < .001$
January 1	0.69	0.47	0.64	16.82	$p < .001$
January 2	0.81	0.66	0.63	53.02	$p < .001$

Summary and Conclusions

Analyses of data obtained during ICAF strategic-planning exercises addressed four key issues: 1) empirical support for the internal validity of the ATDM model; 2) relation of ATDM model to teamwork literature; 3) impact of ATDM practice on teams' self-evaluation; and 4) impact of ATDM practice on the quality of team product. In each case, analyses demonstrated positive, statistically significant evidence in support of the ATDM model and its impact on team decision making.

There is an additional aspect of the findings that cuts across the issues delineated above: We noted with some interest the general tendency for teams' self-evaluations to decline with additional practice opportunities, while the strength of association between those self-evaluations and perceived quality of team product increased. At first glance the findings seem paradoxical when considered together. In fact, they suggest yet another piece of evidence to support the efficacy of ATDM training. The logic of this conclusion is as follows.

In the types of environments in which we study decision making, one of the greatest hazards we have observed is over-confidence in one's plan of action. Particularly in situations where there is no clear-cut right or wrong answer, no single best plan of action or optimal decision, people tend to commit to a plan and to ignore its potential pitfalls (Klein & Crandall, in press). In the present study, too, we found that initial ratings on the AAR survey were quite high, across the board. Virtually all teams believed they were performing well on all the key ATDM behaviors, despite a variety of problems and difficulties during the simulated exercises. Why?

People tend to believe that if they manage to work in a group setting without overt conflict among team members and without abject failure in producing a product, that they have done a good job working together "as a team." This is the case even if they have run

out of time, produced a poor quality product, or turned the entire problem over to a single individual to solve. In the ICAF study, teams initially gave themselves high marks when asked about various aspects of their teamwork, team decision making, and planning activities. Over time and opportunities to practice, teams began to view their behaviors more realistically. They were better able to differentiate among aspects of team decision making with which they were having difficulty versus those they were handling well, and to see the connection between good and poor performance on ATDM behaviors and the quality of the team product.

In sum, the ICAF study provides several lines of evidence to support the ATDM model, and the ATDM training program instituted at ICAF. And, while the results of a single study cannot provide conclusive evidence of the utility and validity of a model, the findings presented here provide a useful beginning for that effort.

SECTION THREE: CONCLUSION

The main purpose of this concluding section is to summarize theory development over the course of this project, given our theoretical base at the project's inception. Another purpose is to summarize methodological development about teaching others how to engage in Advanced Team Decision Making. The final purpose of this section is to address the utility of the technology developed under this Phase II SBIR effort in domains outside of the Phase II test bed (i.e., Phase III commercialization). We will discuss all three of these topics in turn, and will end this section by looking to the future and briefly describing Phase III projects that represent current applications of the ATDM model to other settings.

Theory Development

It is clear that the most important theory development which occurred through this project was producing the model of Advanced Team Decision Making. As stated throughout various portions of this report, the content of the model was derived from observing experienced strategic decision-making teams and identifying behaviors that were key to successful teams. We adjusted the structure, format, and wording of the concepts in the model over several iterations, based on our observational data and on feedback from instructors and students about its meaningfulness, memorability, comprehensiveness, utility, and intuitive appeal.

In comparing our observations about team decision-making behaviors to literature on teamwork, we found that no current model takes into account all of the core concepts of the ATDM model: Team Identity, Team Conceptual Level, and Team Self Monitoring. Models and theories are generally about constructs that we would place in "Team Identity" or they focus on a few constructs that we would categorize as a combination of "Team Conceptual Level" and "Team Self Monitoring." More comprehensive treatments of the subject matter do exist in the form of check lists, or prescriptions for effective teamwork. These lists are generally designed as tools for researchers to use while cataloging a large array of team behaviors, or for observer-controllers to use in determining whether each team member is performing up to the required proficiency level. But, they are inappropriate for our purposes for these reasons: Some lists are too long to be memorable by team members; they would add to a team's workload, rather than streamlining it. Or, if the lists are shorter, they include abstract concepts like cooperation and communication which then require numerous observable behaviors to specify what is meant when applying them to a given setting.

Or, the lists contain such specific behaviors that they are not generalizable outside the domain for which they were developed.

Because no model, theory, or checklist exists in the form that this project required, we felt it was reasonable to use our observations of experienced teams to develop a new model, rather than to attempt fitting our data into existing theoretical constructs. Our study at ICAF, discussed in the immediately preceding section, provided initial support for the utility of this model in helping teams to improve their team decision-making performance, and their team product.

Beyond the creation of this model per se, there were other theoretical developments resulting from this project. They are of a more specific nature, and concern each of the key behaviors in the model. Following is a summary of each of these developments.

The concluding portion of Section One concerning our early theoretical orientation, states that our work with individuals led us to assume that situation assessment would be critical for team decision making. We also anticipated that situation assessment would help teams form expectations which would let them identify gaps and ambiguities in projected events and outcomes. Likewise, expectations would affect the way teams formulated time horizons for directing their attention. We also hypothesized that mental simulation would be important for teams, both to diagnose a situation and to troubleshoot a promising course of action. Further, we assumed that goal clarification or goal setting would be an important component in the decision. Last, we assumed that Team Self Monitoring would be important for managing a variety of team processes related to decision making.

What we discovered from studying the many strategic decision-making teams that were involved in this project was that a larger set of team behaviors than those mentioned above was needed in order to account for what we observed. Not surprisingly, we also discovered that a richer understanding of some of the anticipated team decision-making behaviors was needed in order to distinguish high performance teams from less-advanced teams.

Team Conceptual Level

We had anticipated that goal setting or goal clarification at the beginning of teamwork sessions would be important for decision-making teams. We confirmed this by witnessing many examples of teams who jumped right into their tasks and wasted time pursuing vague objectives, compared to others who understood their mission at the start and were therefore smoother-running teams. But, our deeper understanding grew from identifying that if we extended the concept to include **periodic goal clarification** throughout working sessions, we were able to distinguish between teams who handled **dynamic** situations better than others. We found that some teams were less skillful than others in clarifying their goals as they worked, and therefore didn't realize that some of the goals had become less desirable or less feasible as the situation had changed, or that some of the goals had actually shifted, without the team's conscious awareness, as they were working.

We also realized the need to add the concept of **envisioning process plans**, along with goals, in order to distinguish between teams who both initially established and also

continuously maintained a clear picture of *how* to accomplish their goals versus those who floundered often and showed confusion in what they were doing.

We had also anticipated that situation assessment would be critical for team decision making. We found this to be true, and that, as expected, maintaining a *shared* understanding of the assessment across all team members is crucial. But we did not anticipate that a strategy of seeking divergent assessments before converging on an accepted one would play such a key role in developing high quality situation assessments—ones that reflected the level of complexity that teams were actually facing, or ones that took the enemy's or a competitor's point of view into consideration.

By seeking divergent opinions, teams are not at the mercy of the most vocal or most powerful member to convince them of the logic of a particular assessment, as in "groupthink," which resulted in the failed Bay of Pigs mission in the Kennedy administration (Janis, 1972). In teams we watched where the most vocal member actually could routinely produce satisfactory assessments (which led to satisfactory team products), it was sometimes difficult to persuade them to seek alternative views, or to appoint a devil's advocate before seizing on what appeared to be an acceptable situation assessment. But to the extent that teams did try to seek divergent views, and then seriously addressed the issues that were raised, they generally reported that their team product was better as a result.

In encouraging teams to seek divergence, we discovered that it was important to warn them about a problem that can result when they take the next step of converging on a shared assessment. This is the problem of the "Abiline Paradox" (Sanders & Mullen, 1983) which refers to reaching a false consensus, or in this case, constructing an assessment that meets some portions of each person's view, but in toto satisfies no one. It was often true that not every team member agreed completely with the adopted situation assessment. Here, we encouraged teams to ensure that dissenters' objections were acknowledged. Very advanced teams maintained awareness of these objections in the form of caveats to the team's assessments. Less advanced teams were unable to keep these differences in the team's conscious awareness.

As in our studies with individuals, we found that teams did not always use a simple recognitional strategy with respect to their situations assessments. In some cases teams weighed pros and cons of their various assessments as a means to choose among them. This outcome is likely due to the fact that teams we observed were engaged in strategic envisioning and strategic planning. These activities ranged over a wide scope of content and encompassed large amounts of information that were susceptible to multiple interpretations.

Another area of theoretical development concerned mental simulation. We had assumed that mental simulation would be an important process for teams, as we had found it to be in individuals, in evaluating situation assessments and planned courses of action. But, in these observations of teams, we found that the use of mental simulation as a strategy in situation assessment was not a process that we could easily discern. In some cases it was obvious, as when a team member used a map to talk the team through his understanding of how their planned mission would unfold. In others, it became impossible to distinguish between the thought process of mental simulation and other processes that team members were using to describe to the team their situation assessment. Therefore, while we sometimes found it useful during an after-action review session to suggest the technique of

mental simulation to a particular team, we did not include it as a key behavior in the model of ATDM.

We had also anticipated that mental simulation would be an important process in identifying gaps and ambiguities in the team's information base or in the outcomes teams projected. Again, we had difficulty confirming this owing to our inability to distinguish between mental simulation and other thought processes that lay behind members' descriptions. However, we did observe that teams differed markedly in the extent to which they actively sought out gaps in their information base or in their situation assessments and tried to fill them, versus teams that assumed it was reasonable to work with just the information base that was readily accessible to them.

For example, in the JLASS exercise mentioned in the Introduction, one team nearly caused a (simulated) global disaster because it was so overwhelmed with the amount of information it had. Instead of searching for ways to manage and condense the information at hand, so that the team could then try to uncover gaps and ambiguities, this team made decisions based on incomplete and ambiguous information. This same problem occurred repeatedly in other exercises, with other teams. Ambiguous information was routinely discarded, as if it were of poor quality and not to be trusted. Gaps went unnoticed, usually because no one tried to search for them, not because they were undetectable. We found that simply comparing information available to various team members was often sufficient to uncover both gaps and ambiguous or conflicting information. And, using common logic was often sufficient to either resolve ambiguities or to determine how to incorporate them into the team's plans until they could be resolved.

The theoretical development concerning the remaining key behavior associated with Team Conceptual Level - focusing on the time horizon and range of factors - followed a similar course. We had anticipated that time horizon would be of particular importance, based on an earlier pilot study at the National Defense University in which teams were unable to look far enough into the future to consider contingencies that would make their planned courses of action unfeasible or undesirable. In this project, we observed that the teams whose solutions to strategic world problems were richer, more complex, and more plausible were the teams who focused farther out on the time horizon than other teams. But we also saw that teams who didn't focus enough attention on immediate problems often found that these turned into larger crises over time.

The deeper understanding we gained about the concept of time horizon was recognizing that *balance* is what is important: Looking long enough to anticipate problems and contingencies, while also looking short enough to avoid the run-away growth of a small, immediate problem into a long-term crisis.

We also discovered that we needed to add the concept of **focusing on an appropriate range of factors** to this key behavior. The range needs to be wide enough at any point in time during the team's deliberations that the true level of the situation's complexity is captured and made available for inspection and evaluation by the team. Yet, if the team finds itself overwhelmed by the number of factors it is considering, given a proliferation of second- and third-order interactions, the team can become paralyzed. Or, the team might arbitrarily discard some information because it happens to be the last to be considered, and the team has run out of time before it can consider everything. We found that some teams

recognized when they were becoming overwhelmed, and devised ways to prioritize the factors, so they would be sure to consider the most important factors. Or, they found ways to condense the information so that it was more manageable. These teams developed richer solutions to their exercise problems than did other teams.

Team Self-Monitoring

Theoretical development concerning the component of Team Self-Monitoring followed a course that was similar to the one we encountered for Team Conceptual Level: There was both discovery and deepening of initial understanding. We were primed, from our earlier work in accounting for operational team errors, to verify if team management skills were key to team decision-making success. We deepened our understanding of this critical skill in two ways. First, Team Self Monitoring is really a master process that successful teams use to determine their level of performance on all the key behaviors, including the monitoring of their ability to monitor. In this sense, monitoring is qualitatively different from the other key behaviors of the model.

Second, we found that decision-making teams with whom we were working resisted our use of the term "metacognition," which is a preferable term since it encompasses both the notion of monitoring (i.e., thinking about the team's thinking and actions) and adjusting (i.e., consciously invoking or generating strategies to improve the team's thinking and actions). Because of this resistance to the term, semantic considerations dictated that we split apart the normally conjoined activities of monitoring and adjusting when we represented them in the model.

However, this proved to be a helpful, if not an economical solution. We frequently found that teams *would* monitor themselves for problems with the other key behaviors. And, they might develop strategies during review sessions to improve their performance on particular key behaviors. But, like one team we observed, they often became so caught up in the taskwork of subsequent teamwork sessions that they forgot to use the strategy. For example, one team decided to stop periodically in its subsequent work session to compare the information that each team member knew about the situation. However, even though a team member reminded them of this strategy, they felt too rushed and never got around to it. Or, like another team, a team might remember to try the strategy they developed, but then would not monitor to see if it worked. Thus, a strategy would make its way into the team's repertoire, would be dutifully and mechanically followed, but would not necessarily be helpful (and might actually be harmful) to the team in the long run.

Therefore, we found it helpful that the model conveyed as separate processes the monitoring and the adjusting function of metacognition in decision-making teams.

Last, we discovered that **time management** was one of the critical behaviors related to Team Self Monitoring. Of course we knew that meeting deadlines would be important for strategic decision-making teams before we began this project. But our observations deepened our appreciation of just how important this skill is. Over and over, we watched teams—even very experienced teams—fail to create a time schedule for the discussion items or tasks within their overall plan. Sometimes they met their final deadline in spite of this, but many times they did not.

And, teams who did create schedules often did not prioritize their tasks to ensure that the critical ones received the time they required. Or, like one team we watched, they created a reasonable schedule at the beginning of their work but failed to update it as the situation changed. This team rigidly adhered to the original schedule but did not produce a satisfying product because adequate time was not devoted to newly emerging and highly significant issues and tasks.

Team Identity

The theoretical development we encountered concerning the core component of Team Identity was different in nature from what we encountered for Team Conceptual Level or Team Self-Monitoring. We had not found it essential to study self-identity in individuals to account for their decision-making behavior, and so we had not developed any counterparts to team self identity as a result of studying individuals. But, based on some of our previous work with operational teams, we were primed at the beginning of this project to watch teams for their ability to operate as interdependent units, and we attempted to identify those behaviors that were key to this ability.

The four behaviors that we extracted from our data as critical to account for successful and less-successful teams are those of **defining roles and functions**, **engagement of all members**, **compensating for gaps in the flow of the team's work**, and **avoiding micromanagement**. The theoretical development these behaviors represent concerns the fact that effective *team* decision making (as opposed to *individual* decision making) cannot occur without a team effort. These are the behaviors we identified as critical to support a *team* decision-making effort. These behaviors have been described in other portions of the report, so we will not repeat that discussion here.

However, to anticipate a discussion about the application of this model to intact teams (a Phase III effort), we found that we needed to expand our understanding of "compensation" when working with intact rather than ad hoc teams. In dealing with ad hoc teams, we encourage team members to develop the flexibility to spontaneously step out of assigned roles and functions and fill gaps in the team's taskwork as they arise, without creating a predominant mode of uncontrolled free-wheeling.

What we've found in working with intact teams is that too much compensation has led them to a different problem from uncontrolled free-wheeling: covering over systemic problems. For example, in one case a particular team member was assigned to a role that he was not adequately trained to fulfill, and so another team member gradually took over some of his functions. Without making this problem explicit, no attempt was being made to offer him the training he needed to be a fully contributing member of the team. In another case, a member was overloaded with too many functions. The leader continuously took on different aspects of her work "just this once." This became a pattern, and so this woman's role was not redefined to more realistically reflect the constellation of functions that would be expected of her.

Methodological Development

Instructor Training

In addition to creating a model of Advanced Team Decision Making, one of our initial goals was to develop a program that would allow instructors at senior service colleges

to train students in these skills. Initially, we assumed that with adequate written materials and lesson guides, this training package could stand on its own.

What we discovered is that this is true for only one type of understanding that is essential in this program: the conceptual understanding. We found that both instructors and students could gain a reasonable conceptual understanding of the model by reading about it.

But we also found that instructors at the senior service colleges we visited varied widely in their ability to help teams gain experiential understanding and real skill development in Advanced Team Decision Making. The key to facilitating ATDM skill development in team members lies in the management of the after-action review session. To our surprise, during the mid-course of this project, we discovered that many instructors felt uncomfortable with the idea of facilitating after-action review sessions that would be based on their observations of the team, and on the discussion they would generate around team members' agreement or disagreement with their evaluations. This remained true even after we held informal training sessions with some instructors and modeled how to both observe teams and also facilitate review sessions. In some cases, this was because the instructors lacked experience in facilitating discussions about team processes (as opposed to the content of team products). In other cases, it was because the instructors didn't think they knew how or where to look while observing the team, in order to provide feedback to them about a diagnosis in terms of Advanced Team Decision Making.

Other instructors we encountered were much more prepared to observe teams and facilitate discussion from the perspective of ATDM, using either informal or more-structured review session plans. (We had developed guidance for both approaches.) However, it was not always possible for instructors to be present for all or even most of the teamwork sessions, particularly for exercises lasting several days. Therefore, instructors would be unable to offer meaningful feedback to the team about their decision-making behaviors.

Because of both this logistics problem, and the wide disparity in instructor facilitation-skill level, we decided to create team self-evaluation materials which would serve as the focal point for review sessions, as described in the section above about the training program. Under this plan, faculty were not expected to organize review sessions around a large number of their own observations or to design a question-asking strategy that would lead the team towards a targeted self-evaluation discussion. Rather, they were expected to facilitate a discussion around the team's self appraisal, which was linked to the ATDM model. And, instructors could add their own observations, where they differed from the team's self evaluation or where they represented a deeper understanding of the team's processes.

But, even when using members' self evaluations to guide the review session, we discovered that some amount of direct training for faculty was necessary before they could be expected to facilitate good review sessions. By "good" we mean meeting the objectives described in the section about the training program. Of course, the amount of training needed varies as a function of the instructor's skill level and experience base. Our experience at ICAF was that instructors felt adequately prepared after they had (1) obtained a conceptual grasp of the ATDM model via the lecture and booklet, (2) served as participants in the America 2000 exercise, (3) completed the survey and participated in an after-action review session that we facilitated, and (4) met informally to discuss facilitation of review sessions.

Individual Skills Training

Another objective of this project was to train individual team members in the skills of observation, diagnosis, and strategy development for team self improvement, so that as leaders or members of future decision-making teams, they would know how to help their team achieve advanced levels of functioning. The review sessions were the vehicle for teaching these skills.

Initially, we were providing feedback to teams about our own observations of their performance during review sessions. And, we generated discussion about how the team saw itself. But, without a focused survey instrument, even with a skilled facilitator, review sessions could wander outside the bounds of their purpose. Further, without asking team members to think about and record their own evaluation of the team prior to the discussion, their memory of how they perceived the team's performance could be skewed by the discussion, robbing them of an opportunity to question differences that may have been present. We discovered when we began using team self-evaluation data in review sessions that it was a powerful vehicle to encourage each member's scrutiny of their own evaluation of the team, given another member's differing perception. We noticed a richness in these discussions that occurred when they wrestled with differing perceptions.

What we found was that by discussing specific team behaviors which exemplify key behaviors in the ATDM model, members began to sharpen their focus of where to look when observing their team. Review session discussions also deepened members' understanding of how to diagnose their team, given their observations. Finally, given these diagnoses, their discussions provided guidance in developing strategies for improvement.

Essentially, these are some of the metacognitive skills associated with Team Self Monitoring and adjusting. As we have implied elsewhere in this report, we believe that metacognitive skills are among the most important skills that decision-making teams can have. Means et al. (1993) identified the need to teach "group metadecision skills" if the task is one performed by a team, but that there is little guidance available from research in this area about strategies for doing so.

Lacking this guidance, we developed a method which we found to be successful in teaching team "meta-decision-making skills." That method includes not only providing teams practice with exercises designed to elicit ATDM behaviors, but it also includes training to develop their observational, diagnostic, and team self-improvement skills. The vehicle for this was the structured review session, organized around members' survey responses.

Future Applications

At ICAF

There are three specific applications of the ATDM model currently in place. First, the ICAF faculty involved in strategic decision-making curriculum development have elected to retain the ATDM model for the upcoming academic year, and beyond. The 1992-93 academic year was the test period for the model and training program, as discussed in this report. Faculty met at the conclusion of the year and evaluated the model positively as a vehicle to introduce concepts about team decision making. At ICAF, the leap from

individual decision making to team decision making is described as a critical aspect of leadership development. This development must occur as officers move from direct, hands-on involvement with their staff to leadership positions in which indirect management of processes and systems is required. At this indirect level, team decision making must become the norm.

ICAF faculty are currently developing plans to embed the ATDM model more thoroughly in the curriculum by including it in more classroom discussions and exercises than was possible in the 1992-93 academic year. They are also planning to adapt the model to other segments of their leadership development curriculum.

A Phase III Application

As a second application of the model, we are currently under contract with an outside client to train their decision-making teams in the skills of Advanced Team Decision Making. This organization has recently changed its structure from a functional team approach, where functions include areas such as engineering, contracting, and financial management, which were designed to serve multiple clients and product lines. Their new structure is a cross-functional team organization, wherein specific individuals from each of the functional areas serve on teams dedicated to particular clients. But, they are retaining some portions of the functional areas in addition to creating cross-functional teams. The organization identified a need to supply these cross-functional teams with training support for this new teaming approach, and asked us to develop a training program suitable for their environment that included the ATDM model.

We would highlight three important aspects of this work. First, it represents a successful Phase III application of this Phase II SBIR which began before the Phase II effort was completed. Government funds expended for product development to meet specific needs within one military organization became the foundation for continued product/service development and delivery outside the primary application domain.

Second, support has accrued to bolster our earlier belief that this model is applicable not only to strategic decision-making teams, but also to tactical decision making. As a point of history, we found throughout the course of this project that teams we were observing engaged in a range of decisions. Some were strategic decisions, such as developing non-military solutions to seemingly military problems. These decisions required attention to interacting forces, including political, technological, cultural, and economic forces that impact on our national security. Here, students needed to develop an integrated situation assessment that acted as a framework to capture the whole picture—so that decisions could be made from the big picture, rather than making decisions in a piece-meal fashion.

But, within this strategic-level perspective, many of the decisions that needed to be made were tactical in nature. Once the framework was established, and the goals were developed, teams were often required to take the process one step further—to develop specific methods or tactics for achieving the goals. We found that the ATDM model was also applicable for observing, diagnosing, and implementing improvement strategies for tactical decision making. Further, some teams we observed were tasked with situations that required more tactical than strategic decision making. We found ourselves able to work equally as well with these teams as we did with more strategically-oriented teams.

Likewise, teams within our current client organization engage both in tactical- and strategic-level decision making. The model and training program we developed for them using the ATDM model appears to be equally applicable to both types of decisions.

A third important aspect of this Phase III work is that it involves intact, not ad hoc teams, and yet the model has utility under these conditions as well. As we discussed in the Introduction to this report, our aim was to develop a model and program to aid decision makers of ad hoc teams—teams that form as task forces and then dissolve, or teams that are convened to deal with specific problems and disband when the problematic situation abates. Therefore, our model was not developed to address team-*building* issues such as trust.

We were curious about whether the model could help decision-making teams improve their functioning if they had been operating together for some time, and had developed ingrained interaction patterns that were counter-productive. For example, we wondered if the application of this model could affect a situation in which a team member had become habitually quiet, and the team had stopped seeking this member's input long ago. Or, the case where team members were suspicious of the team leader's motives and deliberately withheld information when the team was attempting to produce a situation assessment.

In the case of this particular client, we have found that the model can address these and other similar types of problems. Again, the power of the model is felt in the review session. When we ask team members to evaluate their own team by using the ATDM survey, and when we display this "snapshot" of how members saw the whole team operating, the differences in ratings on questions relating to "engagement" and "situation assessment," to follow the above example, are obvious. And, when we facilitate a team discussion about these different observations, we have found that most team members are usually relieved to have an opportunity to discuss long-standing problems that they previously did not address because they lacked a vehicle for doing so. By discussing them as problems that affect the whole team, and by focusing on team-created solutions, we have found members are open to making changes and monitoring whether they are working.

Clearly, repeated review sessions are necessary before any substantial or long-lasting change can occur. Our aim in the training program we are currently conducting is to help teams develop their observational, diagnostic, and strategy development (team improvement) skills so that they can continue to address their problem areas back on the job. Our plans include two on-site review sessions to help promote this activity.

Adapting ATDM to Tactical Execution Teams

The third current application of the ATDM model concerns a project funded by the ARI Presidio Field Unit, Monterey, CA. This project is directed at brigade and battalion battle staffs, to identify evaluation methods during planning, preparation, and execution phases of an engagement. The domain involves intact rather than ad hoc teams, tactical rather than strategic issues, and includes execution as well as planning. Accordingly, we began by using the ATDM model, with the intention of adapting it to this setting. Some adaptations are under way, but the core of the model has been retained and serves very effectively to frame the key behaviors we are seeing in this domain. The result of this project will help us to understand the boundary conditions for generalizing the model.

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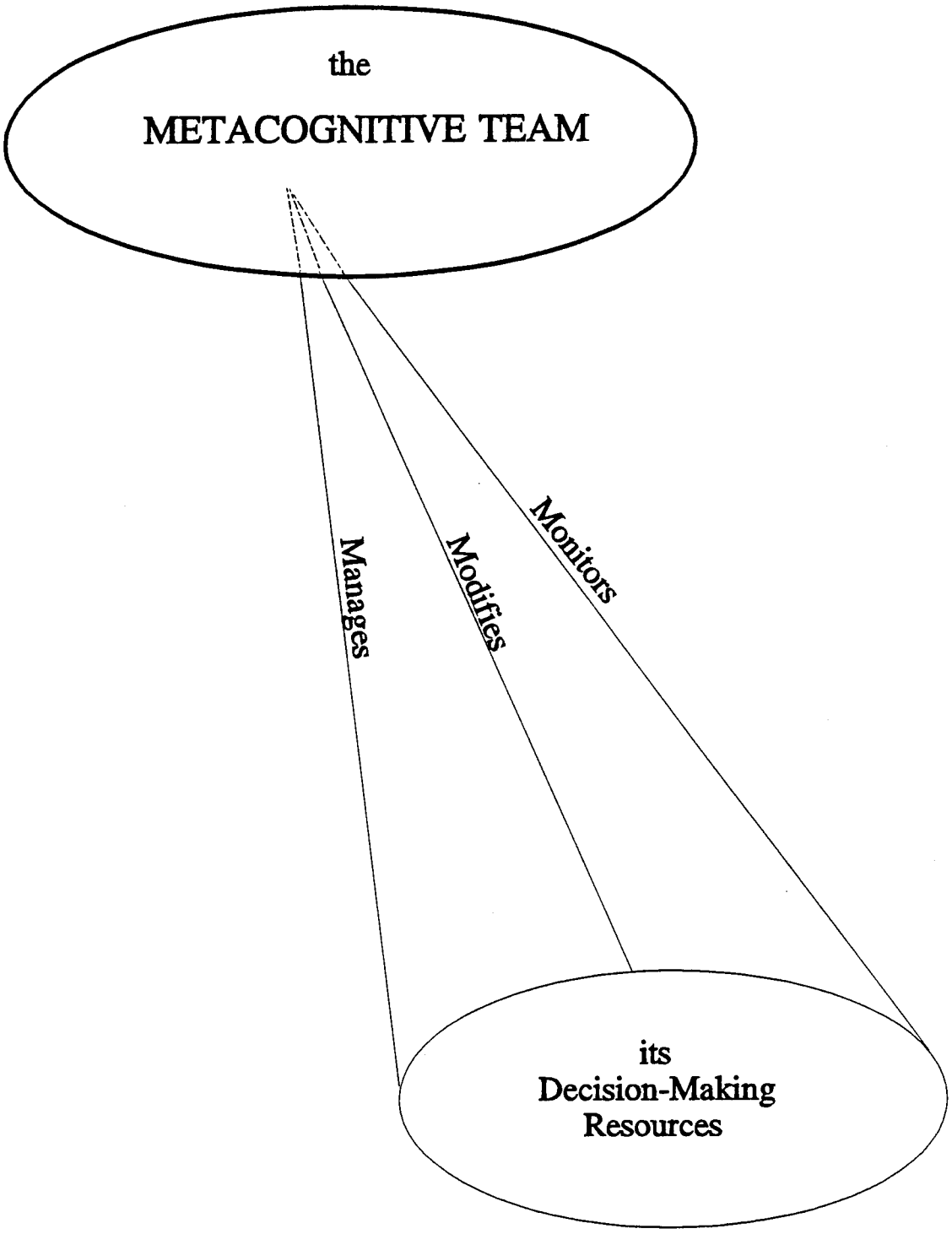
Appendix A

Summarized Metacognitive
Team Materials



Resources of the Metacognitive Team

THE RESOURCE OF TEAM MEMBER USAGE
- Roles
- Involvement
  - disengagement
  - input
  - workload
  - micromanagement

THE RESOURCE OF INFORMATION HANDLING
- Exchange
- Tracking
- Enhancement
  - anticipation
  - confirmation
  - clarification
  - uncovering and filling gaps

THE RESOURCE OF GOAL ORIENTATION

THE RESOURCE OF SITUATION ASSESSMENT
- Field of View
  - scope
  - time horizon
- Shared Understanding
- Divergence
- Ambiguity

THE RESOURCE OF MENTAL SIMULATION

Appendix B

Booklet and Card
Produced for ICAF

KLEIN ASSOCIATES INC.

ADVANCED TEAM DECISION MAKING: *A Developmental Model*

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ADVANCED TEAM DECISION MAKING: *A Developmental Model*

OVERVIEW

Klein Associates is pleased to be a part of your curriculum year at the Industrial College of the Armed Forces. Our goal is to help provide you with the tools you will need to operate as a high performance team member or leader — while you are here at ICAF and, more importantly, as you take on the challenges that lie ahead after you leave.

One of the major challenges will involve the necessity to work increasingly with groups and teams in order to make the decisions required by the responsibilities of the work environment. Team decision making is certainly not new to you — everyone has worked with decision making groups and teams at one time or another in the past. And some of those groups may have even been highly productive and successful in their outcomes.

Our experience, however, is that most are not. Over the past four years, Klein Associates has observed a wide variety of decision making teams. Very small teams, like helicopter and cockpit crews, to very large teams, such as those staffed to suppress forest fires. Command and control teams on all levels — from Battalions at Ft. Stewart, Ft. Hood and Ft. Irwin to Corps and Divisions at Ft. Leavenworth and even in echelons above the Corps level at the Army War College, the National Defense University and right here at ICAF. Teams engaged in real time operations, such as senior officers formulating the strategic plans for national security, to those involved in simulated activities, like crews reacting to simulated flight emergencies at Ft. Campbell and NASA/Ames.

Against this backdrop of experience, observing, and analyzing decision making teams, we have found few *advanced* teams — teams that have reached their full potential. And those which do perform well have not been able to tell us what they were doing that made them so effective. These teams did have some ideas about what was going right. They spoke of the need for good communication and good coordination; for better teamwork, better leadership. But they could not describe the process used or specific behaviors exhibited by their group. This indicated that the team members lacked the know-how to replicate their high performance — as a member or a leader — in future team decision making experiences.

As a result of our observations, Klein Associates identified several *critical* behaviors among the hundreds teams may exhibit, behaviors which distinguished the high performance teams from less productive ones. And we developed an Advanced Team Decision Making Model based on these critical behaviors.

We believe this model is not only a sound theoretical construct for describing how advanced team decision making occurs but a powerful tool for expanding your own personal team decision making

capabilities as well. Our model gives you the handful of critical team behaviors which lead to advanced team decision making and organizes them in a simple, direct, and memorable system.

However, before you can capitalize on the full potential of the model as an advanced team decision making tool, you must first understand advanced team decision making on a conceptual level. Consequently, we present a complete explanation of the model in the following pages. This explanation concludes with a case study to help demonstrate the model in action as a decision making team takes on a strategic decision making task, not unlike those you may encounter in the future. We'll also describe the model in lecture format in Lesson 11, providing an opportunity for questions and discussion. The reading and lecture will give you a new perspective on team decision making, much like putting on night vision goggles to see an otherwise vague or invisible setting. You'll be able to see teams in ways that were not apparent before.

This is a necessary first step, but not completely sufficient. The surest way to change team performance is through direct training and experiential learning. Therefore, we'll give you the opportunity to apply this conceptual knowledge — to practice these key behaviors — in a team decision making exercise in Lesson 13A. Afterwards, led by ICAF faculty in Lesson 13B, you'll participate in a review session to discuss what went right and what went wrong — and, most importantly, the specific ways to improve performance. The hands-on experience of practicing these behaviors will help you achieve your team goal more effectively and efficiently than in the past. You'll learn how to perform these critical team behaviors.

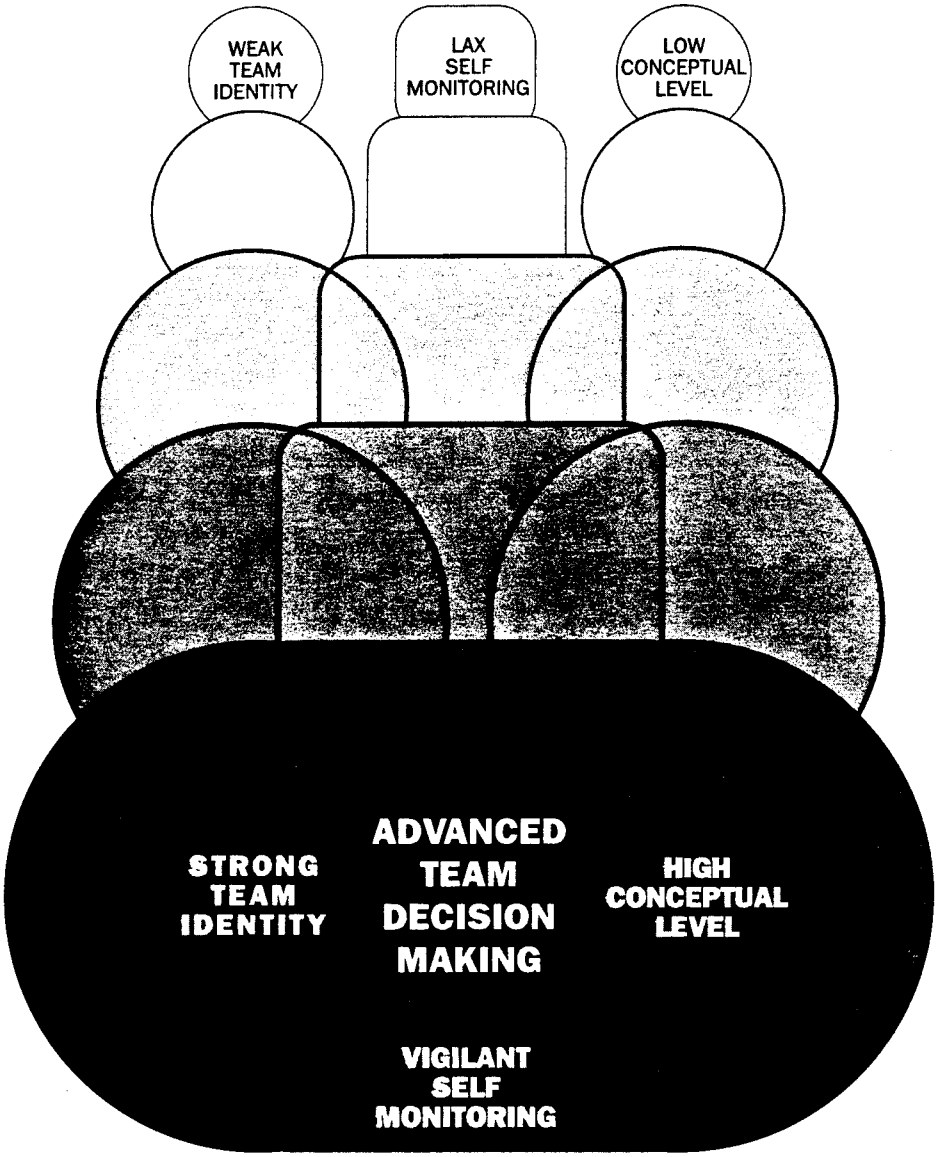
The final step in mastering the power of this tool is to take this learning forward — into the remaining exercises scheduled this curriculum year. ICAF faculty will provide additional opportunities for sharpening your advanced team decision making skills in the National Security Strategy Exercise this semester and the end-of-the-year exercise. These exercises are particularly useful because they require multiple work sessions with built-in review periods for evaluating team performance, formulating specific plans about which team behaviors you want to modify in subsequent sessions, and assessing how well the correctives worked.

Ultimately, the Advanced Team Decision Making Model can be of most value after you leave ICAF and take on a role as a strategic leader or as a support person to someone in a strategic leadership position. When you encounter teams that have not been exposed to this process, the tool then provides the capability to model — and even teach — the advanced team decision making critical behaviors you've learned. To assist you in the future when teams are your vehicle for decision making, we've enclosed a pocket-sized card to remind you of the key behavioral markers of advanced team decision making.

THE ADVANCED TEAM DECISION MAKING MODEL

The Advanced Team Decision Making Model describes a thinking, collective body capable of high performance — by expressing behaviors critical to advanced team decision making and organizing them into three basic components of advanced team decision making: Team Identity, Team Conceptual Level and Team Self Monitoring.

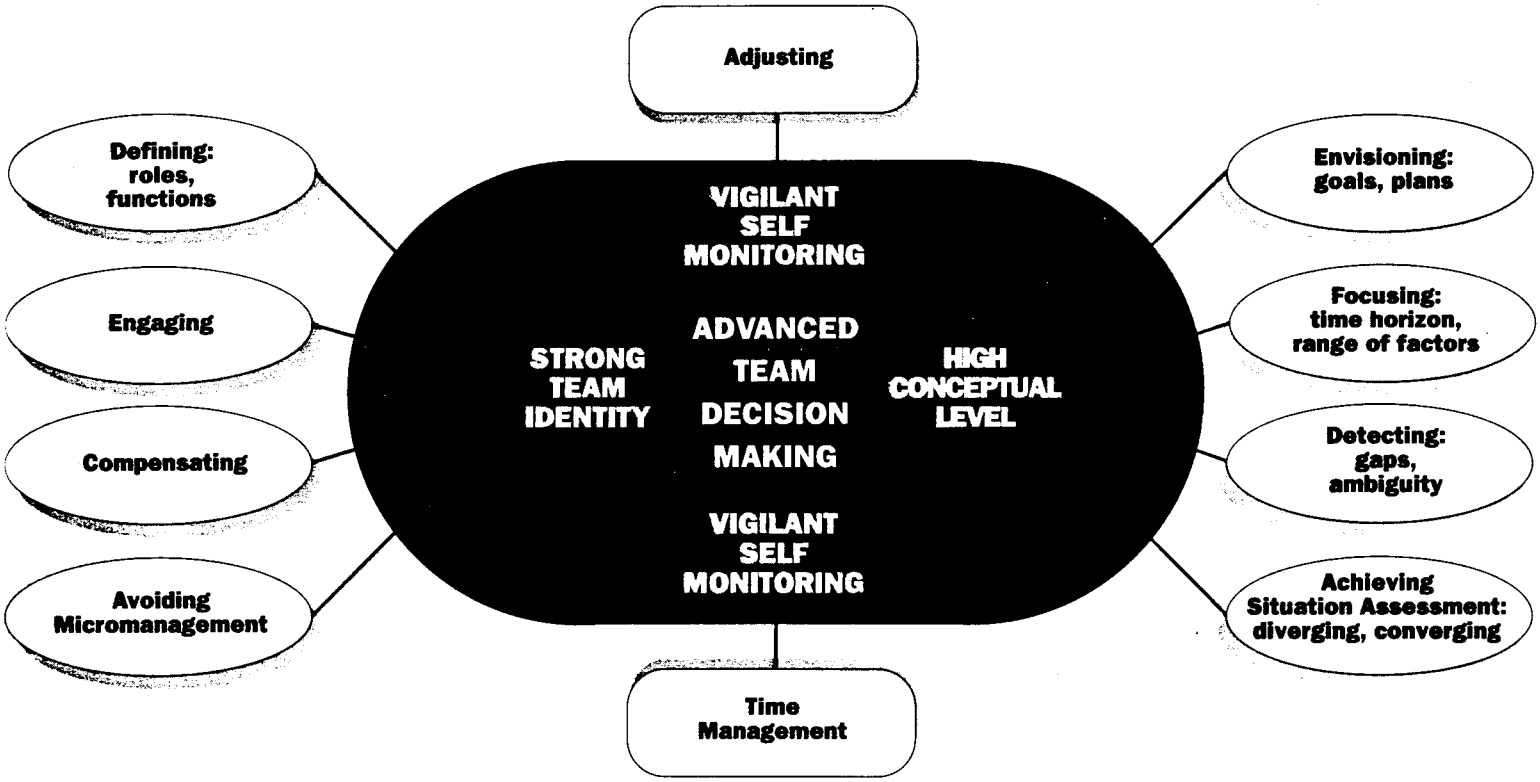
ADVANCED TEAM DECISION MAKING: A DEVELOPMENTAL MODEL



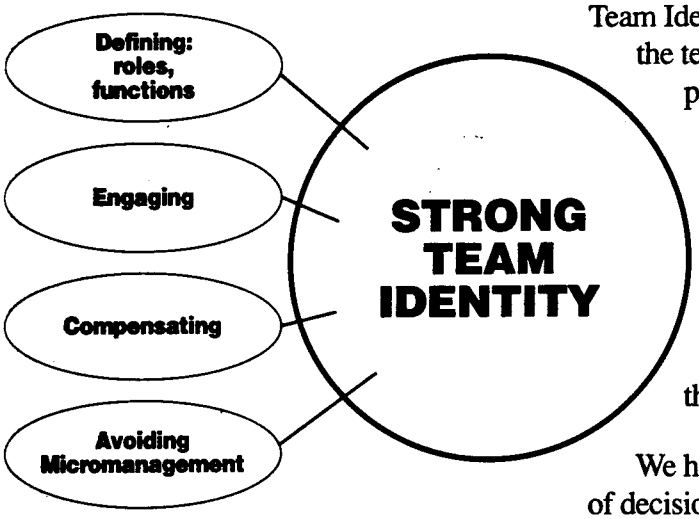
All teams, even those functioning on a very basic level, can be described in terms of these components because they intuitively demonstrate many of the key behaviors — only with varying degrees of effectiveness. But it is the conscious commitment to practice the behaviors appropriately and track them explicitly which differentiates — and in fact defines — the advanced team.

Consequently, we've stated the model in developmental terms not only to indicate that teams can improve but to provide the framework for affecting positive changes. Teams become high performance teams by moving from weak to strong team identity, from low to high conceptual level and from lax to vigilant self monitoring.

KEY BEHAVIORS FOR ADVANCED TEAM DECISION MAKING



Team Identity



Team Identity describes the extent to which members conceive of the team as an interdependent unit, and then operate from that perspective while engaged in their tasks. Think of a hockey team. Each member has his own role — right wing, center, goalie — but as they set up plays and bring the puck down the ice, those individuals begin to function collectively. Every player knows his own zone, where his teammates are, where the opponent is, how much time is left on the clock, what each of them needs to do to hold onto the puck, etc. Equally important, he knows that all of his team members know these things as well.

We have observed that, unlike this hockey team, the members of decision making teams with weak identity are forced to play as individuals rather than as parts of a unit that work together. Such an observation may seem obvious; however, it speaks directly to the basic difference between decision making teams with weak team identity which must rely on their own individual skills and those with strong team identity which are able to capitalize on the power of the group's shared expertise and collective approach to their task.

The quality of any given team's identity can be defined by how well the team is using the four processes, or behaviors, which promote strong team identity:

- *Defining roles and functions*
- *Engaging*
- *Compensating*
- *Avoiding micromanagement*

Thus, teams can advance in the strength of their identity by developing the ways they use these critical behaviors.

Defining Roles and Functions

Team identity begins with the process of defining roles and functions so that each team member understands the task responsibilities and accountabilities of every other member. This shared knowledge and understanding enables teams to plan their moves, anticipate what can or should occur when circumstances change, and react accordingly. For example, our hockey team players in one particular game know that on one of their opponent's line-ups, the center is particularly good at feinting to his left wing. Consequently, they concentrate most heavily on those parts of their roles and functions that involve protecting the goal from the right, but only when that line-up appears. Otherwise, they adopt their more typical play pattern.

Without this more detailed knowledge, team members cannot assess whether the functions assigned to specific roles (people) are even being accomplished, let alone addressed at the level of quality required to meet the team goal. Even worse, they are powerless to adjust these assignments and assist one another when the need arises.

Advanced teams we have watched did not lose this source of power: They actively and continously sought complete awareness of their members' functions, which is of particular importance in the dynamic environment in which team decision making typically takes place. In contrast, basic-level teams we have observed had only a nominal awareness of roles and functions at the beginning of a team's work, which usually involved the perfunctory introduction of all team members and a brief and relatively uninformative description of their team responsibilities at the beginning first team session. However, we have seen that as teams develop their ability to use the role and function definition process, they recognize the need to highlight pertinent aspects of these roles and to emphasize how they relate to the task at hand. Also, they become primed for those situations where clarification needs to occur as changes in the situation demand shifts in members' approaches to the task.

The advanced use of the process provides several important benefits for the team, including the ability to:

- Capture any changes affecting team performance that may have evolved as the team progresses in its work
- Identify shifts in a situation which call for the reassignment or expansion of tasks
- Assign team members to handle these new tasks
- Profit from the resource of "buried" expertise where team members have real-life experience relevant to a team task which is outside their assigned role

Teams with strong team identity strive to achieve a deeper understanding of how the distribution of roles and functions helps the team reach its goals, enabling members to direct themselves toward these goals.

Engaging

Team identity is fostered through the process of engaging, the extent to which the team capitalizes on team member participation in the team's work and responsibility for reaching the team goals. Basic level teams may have members who express their disengagement in a variety of ways: with the attitude of "just tell me what you want me to do and let me get on with my job," with the silence of non-participation during group discussions, with the failure to advocate a strongly-held position or express discomfort with the direction in which the team is headed.

We have seen that more advanced teams recognize that disengaged members are resources lost to the team, and that they try to carefully secure the full value of each member. They are primed to act on evidence that members have partially or totally disengaged, so they can bring them back into the team. They watch for signs of the following shutting-down behaviors:

- Failure to pay attention to an ongoing discussion
- Performance of a different task during discussion
- Demonstration of quizzical or negative facial expressions
- Lack of assertiveness in following up on a question or concern

Recognizing these signals, teams with strong identity take on the task of drawing the disengaged member back in, whereas teams with weaker identity continue on the given course of action without attempting to change the situation. For example, we observed one decision making team with a subject matter expert (SME) whose heavy foreign accent resulted in his disengagement. Frustrated with his inability to make himself understood and his team's unwillingness to invest the time in

understanding what he had to say, the SME stopped participating. Not only was the valuable potential of his expertise lost to the team, but the team sent a dangerous message with significant possibility for snowballing effect: that disengagement is tolerable, that the quality of a team's work will not be affected by the loss of some of its parts. When teams accept the disengagement of any member, they effectively give the team permission to operate without all of its resources.

The team does not have to lose these resources. The presence of disengaged members may be the symptom of a problem that can be solved. Members may be fatigued, overworked, or even overwhelmed by the magnitude of the task at hand. By recognizing that such a problem exists, the advanced team has the power to make appropriate adjustments like readjusting work load, or reassigning functions, that allow *all* team members to function productively.

Compensating

Team identity is strengthened by the process of compensating, the ability of team players to step outside of their assigned roles or functions and perform different ones in order to help the team reach its goals. Back to our hockey team: each member is playing his role as the center moves the puck down the ice. Suddenly, the center is knocked down. Before you know it, another team member has moved in to cover his function. It could be a wing, it could be a defensive player who's out of position and just happens to be close by. But someone covers the gap.

As in our example, most teams have members who are either periodically or consistently unable to handle some of their functions. Teams operating at a basic level of team identity lack members who are able to put their own roles aside and help to fulfill these functions. Advanced teams we have watched set a tone that encourages members to step outside their roles in order to remedy the problems that other members are having with accomplishing their functions.

But it is not enough for team members to compensate when problems arise around a given role or function. In the teams we have watched, the advanced decision making teams also try to learn what caused the problem. There are a wide range of reasons for the need to compensate:

- Uneven distribution of workload so that one member has become overloaded
- Unexpected events that have pulled the team member's attention away from assigned work
- Unwise use of a member's expertise in designating roles or functions

In these cases, advanced teams will even-out the work load, allocate the appropriate resources to deal with the sudden turn of events, or realign team responsibilities along expertise. Basic level teams often struggle with the status quo, feeling locked into appointed responsibilities. Advanced teams remain flexible, shuffling functions to improve not only their members' individual effectiveness but the team's overall decision making effectiveness.

Using the compensating process to build stronger team identity also involves knowing who is likely to step forward when a new demand arises and who must hang back to cover the gap. Inexperienced teams often find themselves at one of two extremes: holding members rigidly to their assigned roles and functions to meet set expectations or tolerating members who freelance when others are depending on them to carry out their assignments.

The entire team — and not just the leader — shares the responsibility for the identification of the reasons for and best ways to compensate. After all, the leader cannot be in all places at all times.

Moreover, some of the leader's functions may need to be covered as well. The advanced teams we have observed seem to realize that all of the functions — even the leader's — must be scrutinized to ensure that all functions are fulfilled.

Avoiding Micromanagement

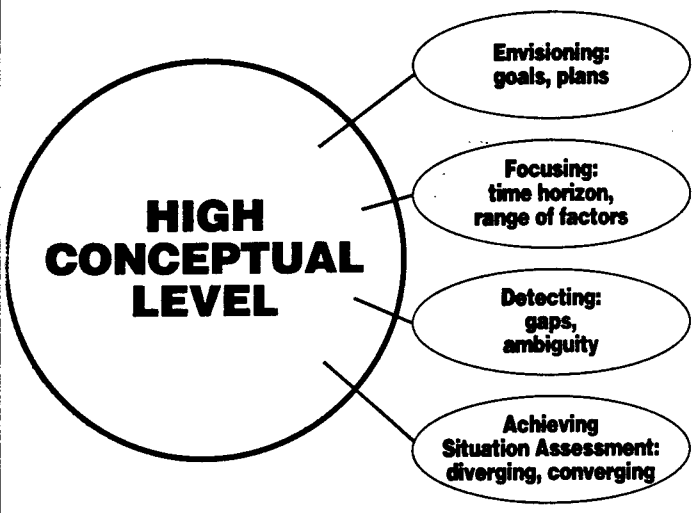
One key way that team identity is maintained is by avoiding micromanagement. Micromanagement occurs when team members manage information, tasks, or people at an inappropriate level of detail. It can divert teams from their goals, compromising the quality of their end products. For example, we once observed a large, multi-service team tasked with the complex goal of developing strategic plans to react to conflicts in two theaters simultaneously. The commander-in-chief (CINC) was unable to fulfill his oversight responsibilities at the higher level because he concerned himself with the tactics, not only helping to develop parts of the plans but giving all parts of the briefing himself. Unlike another, more advanced team we watched, the CINC did not ask his commanders to present their portion of the plan at the briefing. This meant he had to take up a great deal of his time being briefed by each of them so he could give the final briefing.

Basic level teams often fail to appreciate the damage to team identity which results when team members believe their leaders or managers are looking over their shoulders. The behavior often sets up a downward spiral, undermining the team by setting up:

- Confusion about who is responsible for which tasks
- Duplication of other team members' functions
- Interference with another team member's work
- Compromise of the team members' investment in the team task
- Denial of self-direction and -responsibility
- Distraction from the assigned role and functions of the micromanager

Understanding how damaging micromanagement can be to valuable team resources, advanced teams are primed to be aware of micromangement behaviors and take corrective action when they encounter them. Sometimes micromangement is caused by inexperienced or nervous leaders. Here, teams with a strong identity can often resolve the problem by simply discussing it, or the team can restructure some of the leader's functions to reduce the workload and overall nervousness. Other times micromanagement is a function of team members failing to provide feedback to others about the progress of their work. In this case, increasing the frequency with which members exchange clarifying and confirming messages about work in process can help resolve the micromanagement problem. Problems with micro-management can also occur when team members ask for help — and receive it from a leader or manager instead of a more appropriate team member, one who does not have responsibilities at a higher management level. Advanced teams are quick to relieve the manager from this inappropriate role and assign it to a more appropriate member when this occurs. Basic level teams may not even notice that they have essentially become a leaderless team, with no one at the helm.

Team Conceptual Level



Team Conceptual Level captures the notion of a team as an intelligent entity, a "team mind" that thinks, solves problems, makes decisions, and takes actions collectively on a level of complexity and sophistication that matches the demands of the task.

To get a better idea of what we mean by a team's conceptual level, think of a company confronted with the challenge of incorporating a new division into the organization in order to extend their product line. While the potential this new product represents is very exciting, the company must also deal with many complex issues related to the addition of an entire new division. So they call a meeting where all the key players are present— the vice presidents: of strategic planning who maintains the company's growth plan; of finance who allocates the company's resources and tracks its profitability; of human resources who directs the staffing, compensation, and benefits for the company; of manufacturing who drives production and provides quality assurance mechanisms; of sales and marketing who takes the products to market and maintains customer satisfaction.

Like all teams, this one represents more experience, a greater knowledge base, and more diversity through its multiple members than any individual member would have alone. And drawing on this collective power of the team can lead to more creative solutions to problems, a richer assessment of the situation, and a greater ability to handle a wider range of factors during deliberation and contingency planning than what an individual can ever produce working alone.

However, it is difficult to handle the complexities of decision making as a team. Teams must expend effort to ensure that all their members share a similar understanding of goals, objectives, and situation assessment. In our example, the corporate team must put together a cohesive action plan based on a shared understanding of many variables and the alternative ways to handle them: will the new product require further R&D efforts? does the manufacturing of the new product involve an investment in new equipment and if so, how will the investment be funded? should the new division be managed and staffed with existing employees or does it require new technical expertise? can the existing sales force handle selling of the new product or will it demand a dedicated sales force? how will the company inform existing customers, prospects, the industry, and general public about the new division and/or product or should the addition be non-transparent?

If teams fail to maintain a shared understanding, they are more vulnerable than individuals to the possibility of producing plans that are disjointed, poor in quality, or impossible to implement. Teams can also fall victim to conformity pressures: failing to challenge a prevailing view at the risk of making inferior decisions. Or, they may adopt a view which represents a compromise among competing viewpoints yet which the team does not actually support at all.

Teams can capitalize on the power of their collective status and sidestep the pitfalls described above by practicing the processes which promote high conceptual level:

- *Envisioning goals and plans*
- *Focusing on the time horizon and range of factors*
- *Detecting gaps and ambiguities*
- *Achieving situation assessment by diverging and converging*

Envisioning Goals and Plans

Teams that operate at a high conceptual level demonstrate the ability to articulate both the mission (goals) of the team and and the process (plan) the team will use to achieve these goals. The process of envisioning goals and plans requires specific, concrete language, put into a context relevant to the team members, both through examples that relate to their experience and through outcomes that contrast success and failure.

Most basic level teams we have observed fail to ensure that all team members have more than a minimal understanding at the outset about what the team is attempting to accomplish. In effect, these teams substitute an assumption that individual members share a similar understanding of the team's goal for the common understanding itself. Such an assumption can be fatal, especially if the team needs to break into sub-groups to develop various portions of the work. When the team then attempts to integrate the work of the sub-groups into a coordinated whole, they are likely to find differences that are irreconcilable in the time they have left to reach the goal.

Usually, the process of envisioning goals is the function of the leader. In military environments, the leaders of the more advanced decision making teams we have seen provide clarity for the team's overall mission by:

- — Conveying a clear image of the desired outcomes
- — Describing the outcomes that would count or fail to count as a success
- — Providing a basis for determining priorities
- — Presenting a clear image of how the team's mission fits into the larger picture

Where the leader's envisioning is less clear, advanced teams will either request the clarification from the leader or develop it through team discussion. They ask for this clarification at the outset rather than wasting their time pursuing vague objectives.

As teams advance to higher conceptual levels, they not only ensure common understanding of goals at the outset of their work sessions but they are primed to clarify them throughout their work sessions. This is particularly important since it is not uncommon for teams to lose focus on agreed-upon goals or for goals to shift. Goals may change for several reasons. Even though the mission statement is relatively firm, the mission itself might include competing or shifting goals. Or goals might need to be refined or even altered as the team becomes more cognizant of what is actually achievable.

In addition to envisioning its goals, the team must also determine the process they will use to meet their goals. Don't confuse these process plans with the kind of mission planning we've just discussed. There is a subtle but important difference between the "mission" plan — *what* the team will accomplish — and the "process" plan — *how* the team will approach the task. In our earlier example, the

company's mission may be to provide a smooth transition for the new division and product by ensuring that the product is ready for market, allocating appropriate financial and human resources, determining the best vehicles for communication with the public, etc. Their process, on the other hand, might include who is going to define the various alternative approaches, when the team members will need to complete this information gathering, and how the final decisions are going to be made. The distinction is subtle but critically important, since, like our company, the mission of decision making teams is frequently the development of plans.

The responsibility for envisioning the process plan also usually falls to the leader. Less advanced teams often let themselves begin work without good direction about how to proceed and struggle too long before they admit their confusion. Their "process" plan is not a plan at all, just the act of "muddling through." In some settings, this "process" works; in many, the lack of an actual process derails a team.

But the opposite can also happen: teams can spend more time than is available detailing directions to a greater level of specificity than is likely necessary to accomplish the team mission. The issue here is balance. Advanced teams are able to weigh the need for detailed direction against the time they have available to accomplish their mission. In cases where they are unsure about the appropriate level of detail and are pressed for time, we have seen teams with a higher conceptual level establish check points in the process plan, predetermined times for reviewing the process to make certain that everyone has sufficient direction on how to proceed. Setting these check points enables a team to begin taskwork, to "get going." Mental simulation — the process of visualizing where the team needs to be in their task by a particular time and what their work should look like by then — can be a useful tool in deciding where these check points should fall in the process plan. Such simulation has helped the teams we've observed to avoid dangerous pitfalls:

- — Simplistic mission plans, the result of poor process planning
- — Paralyzed teams, the result of teams too overwhelmed even to choose a starting point
- — Failed deadlines, the result of teams bogged down in the process plan

In addition to avoiding these pitfalls, the advanced team also periodically checks to see if the team is on course with its process. A clear and shared understanding of the process is especially important if the original plan doesn't work or in the face of emergencies, allowing the team to improvise, create a modified or a wholly new plan, and still land on the targeted goal.

Focusing on Time Horizon and Range of Factors

Teams which operate at a high conceptual level also demonstrate the ability to focus their decision making within an appropriate span of time (time horizon) and on a relevant breadth of concepts and information (range of factors). Our company from the earlier example may have to develop their strategic marketing plan to introduce the new product within a month in order to preempt a competitor and simultaneously consider the wide range of potential economic impacts of adding a new division to the company. Further, this team would also need to look to the future — to anticipate the effects of this new product on their other divisions several years down the road.

Time horizon describes the focal distance at which a team is perceiving and reacting to the world, whether they see their task in terms of current or future events. The appropriate time horizon is a function of the mission and process plan of any given team. For a helicopter crew, the time horizon

may be the cue that is just beyond the next visible navigation marker. For a Division planning team, it's more like 24 to 72 hours into the future, and for higher level strategic planning teams, it could be 5 to 10 years into the future.

Establishing the appropriate focal point is a matter of balancing current and future events. Teams operating at a lower conceptual level typically focus too closely on the here and now, failing to maintain a focus that is far enough out on the time horizon. Advanced teams recognize and control for this tendency by concentrating on the final goal — and even beyond, to the consequences of the goal into the future. However, the opposite problem can occur as well. Teams can become so focused on the distant future that they fail to pay attention to current matters, resulting in short-run emergencies which concatenate into long-range disasters. To avoid being overtaken by the consequences of failing to consider early problems, advanced teams accommodate both the near and far time horizons.

As teams move from a low to high conceptual level, we have observed that they also become more effective at considering an appropriate range of factors in their decision making. This includes the sensitivity to a wider set of causal factors and to the allocation of its attentional resources so that different team members can capture and integrate different types of information.

During planning or situation assessment, teams we have watched usually suffered from too narrow a focus. It is common for teams at a lower conceptual level to concern themselves with only a sub-set of the total dynamics affecting a situation. For example, they might ignore non-military dimensions of a regional conflict such as diplomatic solutions or economic impacts. This typically happens when team members become too focused on generating sub-goals in planning or situation assessment and fail to assess their likely effects on each other or on the plan as a whole (i.e., first and second order effects.). Narrowing can also occur during execution when team members do not step back periodically to assess if their current status has evolved as expected, or if they are headed in the wrong direction.

But the opposite can also occur. Teams at a higher conceptual level are more successful than less advanced teams at recognizing when they are too broadly focused. When they are in danger of becoming paralyzed by trying to consider too may factors, they may simplify their analysis, break it down into more manageable components, or reduce the number of factors by collecting them into categories. If too many still remain, advanced teams prioritize their information so that the most important information receives attention before time runs out.

Detecting Gaps and Ambiguity

Teams operating at a higher conceptual level demonstrate the ability to discover and fill holes in the team's information base and assumptions and to recognize and handle inconsistencies or contradictions that might be present. We've observed many teams in exercises where gaps and ambiguities are a result of the information given to team members as a function of their different roles on the team. Thus, the intelligence officer may have a completely different perspective than the political advisor.

Ambiguities are not necessarily problems for a team in and of themselves; in fact, they may even provide a source for the development of divergent views since they represent opportunities for discussion and clarification as the team works through them. The problem occurs when decision making teams fail to detect or deal with these ambiguities. Gaps are harder to detect — it's easier to notice

differing or ambiguous information than it is to realize something is missing. We have noted that teams which operate at a lower conceptual:

— Fail to seek out potentially important information that is not immediately available to them
— Ignore what's difficult to reconcile

While these mechanisms for coping with information overload may temporarily reduce team frustration and threats to the team's time constraints, they are dangerous, compromising the ultimate quality of their team's work. There is no reason to believe that missing information is less important than what is readily available or that ambiguous information is unimportant. In fact, it is often the case that what you don't know can hurt you most.

Advanced teams actively attempt to detect gaps in information by scrutinizing what they've been given and by clarifying their assumptions about the information base. When gaps are detected, the team attempts to fill them rather than assuming they must continue to operate without this information. If the gaps cannot be filled, the missing information is noted, so that planning and decision making continues with this problem in mind.

Advanced teams may use mental simulation to search for gaps in a plan. As multiple team members visualize the information at hand with regards to the team's mission and process, gaps in the required steps, in their sequencing, or in their assumed consequences become more obvious. Sometimes these gaps are the function of an incomplete information base; sometimes gaps occur when the team has overlooked some logical steps in the process. Mental simulation can also uncover gaps in the way that various members understand the plan, providing the opportunity for clarification in order to reach a shared understanding.

In our experience, advanced teams are also primed to identify and reduce ambiguous information proactively, checking out quizzical expressions, for example, to determine whether the ambiguity is simply a misunderstanding or a genuine inconsistency. Basic level teams frequently fail to address even obvious potentials for misunderstandings. For example, they do not summarize key points following a lengthy description of a plan or of a situation assessment. Or, their members do not request clarification when they are vague in their understanding, unfortunately assuming it is reasonable to proceed with only limited awareness.

Less advanced teams also often ignore ambiguity due to inconsistencies, such as contradictory information, in the information base. Skilled teams attempt to decrease ambiguity by seeking more information, waiting for more of the situation to unfold, or reevaluating existing information. If ambiguity still remains, and deadlines are not threatened, teams at a high conceptual level maintain awareness of the ambiguity. They don't allow the team to become paralyzed by the ambiguity, but neither do they ignore it. If in time the ambiguity cannot be resolved, they incorporate it as a caveat or qualifier to likely success of plans and actions. Or, if the ambiguity is due to differing interpretations of the situation, advanced teams maintain awareness of these various plausible assessments in order to keep an appropriately complex picture of what might be going on.

Achieving Situation Assessment by Diverging and Converging

Teams operating on a high conceptual level actively seek a variety of views from team members about plausible situation assessments or plans. This process of seeking divergence can provide new insights into the decision making process or uncover critical problems which must be considered

before the team determines the final course of action. In one team we observed, for example, the CINC began a work session by polling each team member for his or her assessment of the situation. While explicitly polling each member exemplifies one important aspect of seeking divergent views, in this case it turned out that all team members saw things the same way. Thus, there really wasn't divergence in thinking about this situation. Rather than being overjoyed with the unanimity, the team decided they should take another 20 minutes to interpret the situation from the enemy's position. This exercise revealed a potential flaw in the assessment with dangerous ramifications for the success of the team's mission.

Unlike this team, the basic level teams we've observed often assume that the absence of voiced differences with a prevailing situation assessment or plan means that alternative interpretations of any significance do not exist. They accept the first plausible situation assessment that emerges, without a critical analysis of its potential for serving the team's mission. Then, they plunge headfirst into the creation or execution of a plan based on an unexamined assessment.

Even when divergence is voiced, inexperienced teams sometimes fail to keep track of it. During situation assessment, it is not uncommon to find that alternative interpretations vanish from the team's mind when a narrow majority favors one interpretation of events. This is particularly unfortunate if it later becomes clear that the selected interpretation is wrong, for then the team is unable to substitute portions of the rejected perspective that could have been useful.

Advanced teams value the different experiences and perspectives of their members which are manifested in different assessments. These teams do not just tolerate different viewpoints; they explicitly seek divergence from their members to sharpen and deepen their situation assessments and plans of action. Teams operating at a high conceptual level encourage diversity rather than suppressing it as an unwanted complication. Their commitment to the process of seeking divergence is so strong that advanced teams play devil's advocate when they do not uncover divergent viewpoints, reviewing the expectancies contained within their situation assessment and evaluating them for consistency with incoming information or the projected future. We have observed that even under severe time pressure, advanced teams remain aware of other existing perspectives and temper their actions accordingly.

There is an obvious interaction between the strength of team identity and the team's ability to successfully seek divergence. On teams with weak identity, members are often hesitant to voice dissent or differing views. Teams can overcome this hesitancy, even before they have established strong identity, by voicing their expectation for members to seek out and offer divergent views and for their intention to monitor one another for this behavior.

But again, the issue is balance — balance between getting a variety of views on the table versus attaining agreement before time runs out. When teams spend too much time seeking divergence and are forced to give short shrift to the convergence process, they can wind up with:

- False consensus on the accepted situation assessment
- Simplistic situation assessment
- Uneven understanding of the accepted situation assessment

So, for example, even though the corporate vice presidents from our earlier scenario may have expressed their very different views at the new division/product strategy session, the president hastily summarizes what she presumes constitutes the majority view as time begins to run out. Her assumption sets up a domino effect. Several vice presidents who disagree do not speak up, sensing the time

pressure as well. The vice president of marketing agrees with the president in principle but believes her solution lacks the power to help them anticipate and then deal with some of the counter-measures their competitors are likely to take — issues that the team did discuss but left hanging. Now, those issues seem lost all together as he too decides not to verbalize his concerns in the interest of time.

Worse yet, this silence also prevents the team from knowing if everyone shares the same level of understanding about the accepted situation assessment, critical information for predicting team mate behavior when the inevitable unexpected problems occur. Compensating for those problems — making the necessary adjustments — will be near impossible, just as it is when a team lacks a shared understanding of its goals.

Teams operating at a high conceptual level demonstrate the ability to reach a shared understanding across all team members of a commonly held situation assessment. While the corporate vice presidents from our previous example came to the new division/product strategy session with very different expertise and priorities, they were able to work through their distinct perspectives to arrive at a group opinion.

The more advanced teams that we have observed ensure that all their members understand the situation assessment before generating or implementing the plans which will flow from it. They appear to differ from more basic ones in another important respect: they are less likely to be derailed by changing situations than basic level teams because they recognize the need to reassess the situation when information changes. They analyze whether these shifts call for modifications to their plans or actions in order to reach their overall goal and ensure that these shifts in situation assessment are understood by all team members.

Finally, advanced teams are better able to develop complex situation assessments in cases where complexity is warranted. They can use mental simulation, for example, to take the perspective of the opponent, imitating the way the opponent would construe their situation assessment and using the simulation as a means to evaluate its adequacy.

Team Self Monitoring

The model's components of Team Identity and Team Conceptual Level are states of being, qualities which describe the extent to which a team has achieved a more advanced team decision making capability. We have described the critical behaviors or processes that help teams further develop their capabilities in both of these components. The third component in the Advanced Team Decision Making Model is a process in itself — a regulatory process for all of the other processes we have discussed thus far. Self monitoring is a master tool which helps teams promote advanced team decision making, moving from weak to strong identity and from a low to high conceptual level by determining how successfully the team is using key behaviors. Team Self Monitoring by definition is the ability of a team to observe itself while acting within its tasks.

Just as teams vary in how well they use these advanced team decision making processes, teams can also differ in the effectiveness with which they monitor themselves for the use of the behaviors. While the very name of this component — self monitoring — could imply that this process is a function of individual team members, the "self" here is actually the team. The collective body takes on the responsibility for the process. We have observed that successful team self monitoring is frequently a function of two of the most important diagnostic behaviors:

- *Adjusting*
- *Time management*

Adjusting

Adjusting is the ability to modify the way the team is performing when problems are discovered through the monitoring function. It is one thing, for example, to engage dutifully in the process of envisioning goals; it is quite another to sit back and assess whether all team members understand the goals clearly or to determine periodically if everyone is still headed in the same direction. As you've seen in our discussions of Team Self Identity and Team Conceptual Level, adjusting can be used to improve all of the advanced team decision making processes. Most significantly, the advanced decision making teams we've observed frequently and actively incorporate the adjusting process into their taskwork. They do this in an iterative fashion — watching, adjusting, watching again, adjusting again and so forth.

Advanced teams periodically step back from the task work to ask how well the team is doing. They consciously reflect on the processes they are using to accomplish their work. However, it is not enough for teams just to consider or even to alter their use of a process. When the advanced level teams we have observed determine the need for a corrective measure, they implement one and then reevaluate to see if it has solved the problem. We have also seen teams operating on a more basic level

who discovered problems through self monitoring, decided on a corrective, and then stopped monitoring, failing to check out whether the corrective worked. Worse yet, one team determined the need and approach for a corrective and then because of poor time management failed to implement it at all.

We can sum up in one word what a team develops when it exercises the process of adjusting: insight. The act of watching the team for its performance on all the processes associated with team identity and conceptual level, and adjusting or changing its performance when problems are discovered is how insight is learned and team performance ultimately improved. Insight involves having a mental model about how the team should be operating — a mental model that includes a set of expectancies about what the team should look like and what it should be doing. The expectancies concern many things, but the most important ones are the processes associated with team identity and conceptual level.

As the team practices its monitoring of these processes, it develops skills in knowing where to look. As the team tries to improve its use of the processes, it learns how to adjust. By making these changes and recursively monitoring their effects, teams learn how to become vigilant in self monitoring, and they confidently handle new challenges and requirements.

Time Management

Time management is the ability to meet goals before deadlines overtake the team and to sequence sub-tasks effectively so that output from one task becomes timely input to the next one. Inexperienced teams frequently jump directly into a task without considering the amount of time they should allocate to each portion of their activities. The more advanced teams we've observed create schedules and work steadily towards their milestones. They check periodically to see if they are meeting these deadlines. And when their projections indicate that they will not be able to accomplish all the tasks they had originally planned, they re-prioritize so that the most important ones can be completed. They also keep all other team members informed about these changes.

Even teams with developed time management skills may fall victim to inconsistent monitoring of their schedules. They work steadily toward their deadlines, only to realize at the last minute that various portions of their deliberations or product just don't fit well, or that parts are missing altogether. Advanced teams often set up trigger-points to alert them to approaching deadlines and guard against the dangers of focusing entirely on the task work. Sometimes as a deadline approaches, a team finds that the general quality of their product is satisfactory, but realize too late that their work could have been vastly improved with only a little more time.

Protecting that last segment of a work period for review and final revisions is difficult in the midst of competing demands, but it is often what distinguishes an excellent product from a mediocre one. Without this protection, teams lose their ability to monitor and manage their team identity or conceptual level, breaking down into a flurry of activity just prior to a deadline. The result is frequently work which comes frustratingly close to success, but doesn't quite hit the goal.

To avoid this last-minute breakdown, we have observed that more advanced teams build cushions into their time schedules, particularly when they are less experienced with the task at hand. They understand that unexpected additions to their tasks and unavoidable difficulties are more common in this scenario, and use that knowledge to gauge the size of the cushion they will need.

CASE STUDY

What follows is a case study of a decision making team engaged in an exercise conducted at a senior service college. We chose an exercise as our case study because it is immediately applicable to your activities at ICAF this year. However, we believe you will find that the model is even more valuable for "real-life" team decision making situations. As you read through the descriptions of the team's mission, the background information they were given to accomplish their task, and their general practice of team decision making behaviors, be aware of this team's Self Identity, Conceptual Level, and Self Monitoring. Evaluate how successfully they practice the various processes we've examined in the description of the Advanced Team Decision Making Model.

At the end of the case study, we analyze the team's performance by evaluating how they used these specific processes which promote advanced team decision making. Because not every process plays an equal role in the case study, our discussion focuses on those processes which the team either used well, failed to use, or misused.

The exercise scenario simulated a six-month period, compressed into three days of exercise sessions. The team's task was to develop alternative courses of action for the President to consider as the U.S. response to the unfolding situation.

The hypothetical situation concerns two real countries — however, the names have been changed here, as well as some of the background information. The scenario involves a potential threat to Moreva, an ally to the U.S., based on a developing situation which involves its neighbor to the west, Toldornia. The U.S. does not have diplomatic relations with Toldornia.

As the exercise begins, the situation is one of probable hostility between the two countries. The team knows the scenario can change at any time, and that they will be given updates about it as the exercise progresses. They also know that the alternatives they generate need to be consistent with political, economic, and military constraints and objectives described in their exercise materials. These are to be updated or changed periodically, as the situation evolves. Additionally, the team is to respond to diplomatic considerations from the international front which are under continuous flux as deliberations at the United Nations and various other multi-national organizations continue to evolve over the course of the crisis.

Background: *Toldornia has conducted a series of small-scale military exercises over the previous two years. These culminated in a large-scale mobilization and military exercise that has included the recent movement of sizable forces closer to a de-militarized zone that separates the two countries. (This zone had been established following a civil war 20 years earlier, which had resulted in the formation of the two countries.)*

Reliable intelligence indicates that Toldornia is planning to begin DMZ confrontations, and is prepared to go to war. The exercise materials explain that one plausible reason why these activities are taking place at this particular time is that Toldornia feels it is running out of time to negotiate reunification under terms favorable to them. This assumption is derived from the fact that Moreva has been experiencing increased social cohesion, due to greater democratization and economic development. Toldornia sees a window in which to fuel the reunification fires while taking advantage of Moreva's economy to solve their stagnating economy at home.

Both countries espouse an interest in reunification, but only if they can do so under conditions that meet their political and economic interests. The U.S. and its allies maintain a strategic interest in that portion of the globe, as does the coalition of governments that support Toldornia. Therefore, global involvement is expected if the two countries enter into a confrontation.

The Exercise

The team consists of a commander-in-chief (CINC), several staff members — an assistant, a political advisor, an intelligence expert, a logistics specialist, and an operations specialist — and a commander from each of the services. As the session begins, the CINC is reminding everyone that they have all received their exercise instructions last week, ". . . in plenty of time to read everything. I'll just remind you that the materials include a mission statement, a schedule of when our alternatives are due each day, and background information about the situation that's relevant to your role. We've got a lot to do in just a little time, so, if you have any questions, just look in your exercise booklet to find what you need — let's not bother each other about information we can find on our own."

"You all know I'm the CINC this time. I'll try to stay out of your hair — commanders, I'm sure you can do your jobs. Why don't you take a look at whatever you need to be worried about, given the material in your packets. I'll work with my staff here for a while."

As the two groups re-seat themselves into two clusters at opposite ends of a large room, one of the commanders and the political advisor remain in their previous places and begin reading through their materials — it appears they had not read them before. Both groups begin without these two people.

Within a few minutes, the rest of the CINC's group assemble, and two of the members begin a discussion. They throw out pieces of information about Moreva and Toldornia that were contained in their exercise materials. Several other members begin doing the same.

Some of the information appears contradictory — the team becomes increasingly confused. For nearly half an hour the members continue in this vein. Then, the assistant CINC observes that they all had a lot of material — "Just look at the stack of stuff we've all been given. We'll never get through it all this way." They all look to the CINC, who says he thinks most of their work has already been done for them — "There's a plausible description of the situation in our exercise material — why don't we just go with that as our starting point?"

They agree, and begin bringing up information from their materials about events in both countries over the last two years that support that view. They do not return to any of the previously-mentioned contradictory information. They emphasize the recent military build-up near the DMZ, and Toldornia's "now or never" attitude about taking drastic steps to hasten reunification.

The team's discussion then turns to speculation about just what Toldornia would do. Three of the members engage in the majority of the conversation. It takes a considerable amount of discussion, but they finally agree that it would be logical for Toldornia to begin with DMZ infractions, then to launch an all-out war against Moreva. They assume that Toldornia would move swiftly and forcefully against the capital, Yalkap, which lies close to the DMZ, since Yalkap is difficult to defend without loss of civilian life. Further, they assume Toldornia could be successful in demanding reunification under terms that are more favorable to them than to Moreva, since Moreva would not want to risk widespread destruction within Yalkap. Last, the team reasons that even if Moreva does not initially agree to

reunification, it is likely to lose Yalkap before it can establish a new defensible border, which would probably lie to the east of Yalkap and the existing border. Thus, they feel that Moreva will soon be faced with two bad choices: Accept reunification on unfavorable terms, or retain independence but lose Yalkap.

The team is now about one hour into their exercise session, which is scheduled to last three hours. The members of the other sub-group wander over to the CINC's group, as had the two members who had been reading through their materials at the start of the exercise.

The CINC asks the commanders, "Have you figured out what you're likely to get?" (meaning, what air, land, and sea assets and forces they were counting on from the U.S., its allies, and Moreva).

The two commanders who had been working together say they figured that out within the first ten minutes — "We just put together a few of the lists and memos that were in our packets and came up with the combined forces and assets we could count on — you know — just in general terms. Like where they are, how long it'll take to get them in place, what their support requirements will be. We've been waiting for you to let us know what to do with them — to tell us what the types of responses are that we'll give to the President so we can work some feasibilities for you."

The Naval commander who had been reading during the time that these two were meeting says, "What about the naval forces?"

"We figured you'd plug in your information — your analysis — when you got done."

The intelligence officer asks if they have taken into account the possibility that Toldornia might use chemical weapons, and how that would affect the force structure they plan for.

"No, we didn't — that wasn't in our information. Was it in yours? We just got a look at what our maximum strength might be — we didn't look at special problems."

The political advisor asks, "Well, what about the problem that's brewing in the mid-central region — we may need to commit some forces there in the near future...did you factor that in? And there's that consideration about using our forces to transport and distribute food in the lower Lantrell region where the famine is spreading. You know how the Secretary of State is pushing us to change the image of our forces — that new idea of 'forces for peace'."

"No, that wasn't in our packet — we're waiting for some guidance about those sorts of things."

The CINC says, "OK, I can see we've been wasting some time here — let's get moving. Let's build some responses for the President." One of the CINC's staff asks: "So what are we saying? That we expect Toldornia to initiate the hostility, and we want to be able to defend?"

The CINC replies, "Well, that could be one, but I think we're also saying we need to preempt that thinking on the part of Toldornia — that we need to have such a huge show of force that they won't even think of starting anything."

"How are we going to get world opinion in our favor for that? You know they said in that memo we can't count on international support for a move like that — you know, because of the potential oil embargo if our intentions are read wrong."

"Why would our intentions be read as anything other than they are? We can use our diplomatic routes to be sure our intentions are known. We'll get world opinion on our side, all right. They'll be just as scared of this situation as we are — they'll be looking to us to keep a lid on everything."

"I'm not so sure. There's been some recent history that might worry some of our allies, let alone the countries where we don't have strong relations."

"Well, we can't know about that, and we've got to get some responses together. Let's just assume we can convince everyone (of our intentions) — and if the President doesn't like that alternative, he doesn't have to go with it."

Another member says, "Yeah, but suppose we do start moving forces — Toldornia will know it. It'll be like lighting a fuse under them. Either we've got to figure a way to be more invisible, or cloak our intent with a convincing alternative explanation."

"Or else we've got to take the pressure off Toldornia — figure out another alternative for them besides attacking Moreva — give them a way to improve their situation short of the attack."

The conversation continues in this fashion for another 30 minutes. The CINC, who is becoming increasingly nervous, says they really must close off the discussion and produce some responses to give to the President.

Several members resist, saying they haven't even gotten to other issues that could impact on the responses they develop, but the majority of the team agrees that it is too late for more discussion and analysis.

In the remainder of the session, the team tries to produce three different responses for the President, based on a plausible assessment of the situation. All three responses are focused almost entirely on assumptions about the two countries; they take little notice of the many pressures from other portions of the globe that could interact with the Toldorian situation, even though some of them had been brought up by team members earlier.

The CINC asks his assistant to record major points of agreement among team members as they hurridly generate their three responses. The assistant does so, but not in public view. When the CINC eventually briefs the President's Chief of Staff (played by the instructor), his material is based on one team member's impression of the whole team's ideas, along with his own. After the briefing, several team members tell the CINC that his briefing did not capture the essence of several of their important discussions.

The Chief of Staff's reactions to the team's set of recommended responses include questions about:

1. the long-range implications of each response they developed
2. contradictory information contained in their materials that could lead to interpretations besides the plausible one described in their exercise booklet — why hadn't the team considered several other scenarios and a response to each, rather than a single scenario with three different responses to it
3. conditions in other parts of the globe that could impact this situation
4. diplomatic as well as military responses to the situation
5. what led them to believe that they could count on international support for two of their responses, both of which would fail without it

6. the need to address the immediate threat of chemical warfare
7. a few geographic constraints that were not adequately addressed by the responses.

The Team's After-Action Review Session

The team expressed frustration that several of the Chief's criticisms had come up during discussion, but had not been dealt with. Other members said a lot had come up, there was no way to deal with everything that came up, and they only knew by hindsight what turned out to be important.

Another member said "Hey, guys, that's the way things are in real life, too. We've got to get a better handle on how to anticipate things, how to incorporate more information and ideas."

"Yeah, that bit about geographic constraints was easy — we got most of them...I can't believe we missed those other few."

"I didn't miss them — don't you remember when we talked about them?.... I thought you were going to go back over the responses and incorporate the changes we suggested."

"We talked about a lot of things...."

The CINC, who appeared both defensive and apologetic for the team's mediocre showing said, "Well, I think we can handle this assignment. I think we just have to do a better job of working as a team. We've got people here with a lot to offer — a lot of knowledge, a lot of experience. We missed the big picture here today — we got bogged down with too many ideas."

"But I thought we wanted to generate a lot of ideas and pick the best of them."

"Yeah, I know, but we need to think bigger with them. We could have come up with better responses if we had more time...or if we used it better. Tomorrow, let's work harder on coordination and teamwork. And, let's all come prepared having thought about the new material they'll give us for overnight reading."

"How are we going to handle all the information? We may have had a lot of ideas here today, but they sure didn't cover everything they needed to."

"Let's just try to watch for that and interject when we think the team is forgetting something. We're all experienced people here. I think we can handle this."

The Analysis of the Team

OVERVIEW

The CINC's approach to the situation was to give the team a pep-talk. While he did put his finger on some of the problems — not looking at the big picture, getting bogged down with all their ideas, and the need for better teamwork, neither he nor any of the team members worked towards specific changes they could make in the subsequent session.

Sensitivity to problems is a necessary first step to solving them. But without a plan for addressing difficulties and helping people know what to do differently the next time, chances for improvement are slim. Further, without knowing how to systematically diagnose the full range of problems, the team can miss several that can wind up derailing it.

Unfortunately, few teams happen to have members who are aware of the key behaviors that need monitoring and managing. Most teams ignore their decision making processes altogether, or else they struggle with a haphazard review much like this team did. A more structured review session and systematic evaluation of key behaviors addressed by the Advanced Team Decision Making Model would have allowed the team to identify specific ways to improve. In the following sections, we provide a critique of the decision making processes of the team presented in the case account. While the issues presented are ones that we would have addressed in a feedback session with this team, we typically would not deal with every process or every one in the amount of detail which follows. Even relatively advanced teams would be overwhelmed by so much information. For the instructional purposes of the case study, however, we wanted to discuss all relevant team identity and team conceptual level processes to enhance the learning potential of the exercise. We examine all processes except for avoiding micromanagement, which wasn't an issue in this particular situation. We also offer ideas about how the team could have done things differently and suggestions for remedying some of the problems they encountered.

ENVISIONING GOALS AND PLANS

Envisioning goals and plans was essentially absent as a team process. The CINC began the session by stating his assumption that most information, including the mission statement, was contained in their exercise materials. It was as if he felt it would insult their intelligence and waste their time if he went over the obvious. And, no one from the team questioned whether it made sense to begin without this clarification. Nor did anyone ask for clarification during their work session.

If the team had evaluated their use of that process during the review session, they would have discovered its absence. Most probably they would have resolved not to begin their subsequent session without having a better sense of what their goal was. They wouldn't have wasted as much time during their disjointed discussions if they had begun by envisioning what would count as a successful set of responses and maybe contrasting that to what an unsuccessful product would look like. For example, they needed to consider political and well as military responses to the problem. International support for the responses was also important. The need for a bigger picture would have emerged from this envisioning of the goal.

Also of major importance for this team was a process plan, and some time management of that plan. It's not as if the CINC was unaware of the need to manage time — he did remind the team several times of the need to "get moving." But, a more detailed plan of how to approach the problem, and how much time to devote to various steps in the approach was needed.

If the team had taken the time to develop a process plan, they would most likely have realized that the commanders' team would need to meet for only a short while to discover maximum assets and forces. They could have been given other tasks, they could have re-joined the larger group sooner, or they could have worked with staff members like the political advisor who had some information that they didn't — such as the threat of chemical weapons and the possible use of forces elsewhere.

More important, they could have laid out the steps they would need in order to generate the responses, estimating the amount of time it should take for each. Also, they could have set check points where they would stop to evaluate whether they were still on course.

DEFINING ROLES AND FUNCTIONS

The team got off to a poor start partly because the CINC assumed that team members had a firm grasp on how each others' roles and functions would work in this exercise. This was a risky assumption, and none of the other team members questioned it. While it is common in scenarios like this to divide tasks into command and staff functions, there is no reason to believe that team members would have an understanding of what particular tasks they would need to address, given this specific exercise and their assigned role in it. This assumption was not warranted, as evidenced by the commanders requiring only ten minutes to do what they thought was initially expected, and then waiting an hour before approaching the others to see where they were in their work as it might relate to their next task.

Another indication of a poor start for this team was their lack of awareness of the perspective each person would be representing during decision making. The best teams we have watched have asked each member to briefly state how they interpret the information they have, or what information they are particularly sensitive to, given the perspective of a political advisor, for example. In this case, there would have been a big pay-off to this behavior. It would have aided in clarifying what kind of information any particular team member might expect from another, or who should be on the receiving end of some data analysis (the common pay-off). In addition, the team would also have been likely to discover that each person had some information that the others didn't — that it would be very important to get this information onto the table.

COMPENSATING

A subtle yet powerful example of the need to compensate happened toward the end of the exercise. When the assistant CINC was asked to summarize and record the major points of agreement among team members he did exactly what he was asked to do. But he was so locked into capturing the ideas, that he failed to present them to the rest of the team as he was summarizing them.

They had no opportunity to determine if he was capturing their thoughts as they intended them. An example of compensating would have been for another member to step outside his or her role to get some butcher block paper and write down the summary in full view of the team. Or, if none was available, some one could have requested the Assistant CINC to read each point as he complete it, to get the team's reaction to his wording.

ENGAGING

The political advisor and the naval commander did not engage in the first hour of the collective task because they were not prepared — they needed to spend time reading through the materials. We have observed this in many teams and the behavior is usually ignored, as it was here. These members were lost resources to the team during the initial work period, and a message was sent that this was okay. A better approach would have been to ask how long they would need to get up to speed, and to figure out the best way to proceed without them until they could join in.

Second, having seen that this was a problem in the first work session, the CINC should have asked at the end of their review session if everyone would be able to come prepared the next day. Instead, he

just told everyone to think about their over-night reading. Either he, or another team member should have asked if everyone would be able to do that. If not, they could have generated a plan to re-allocate some roles and functions on a temporary basis.

DETECTING GAPS

One of the early steps would have been to poll the team members for their understanding of the situation. Differences across members about their understanding would have alerted them to differences in the information provided to them in their exercise packets. The team appeared unaware that the political advisor and intelligence officer each had information that the others did not have. Even when the team discovered (by accident) that they had been given different sets of information, they did not then redirect the ongoing discussion to find out what the full range of factors was.

Nor did they keep track of what information the team was missing in order to later develop responses that were compatible with all of it. The step of evaluating their responses for this compatibility was entirely absent.

DETECTING AMBIGUITY

Another problem with this team was their inability to deal with contradictory or ambiguous information. They became confused by it. Instead of explicitly exposing contradictions and ambiguities in the information base, they threw them into the discussion and then ignored them.

Suppose the team had made a deliberate attempt to get the full range of factors out on the table before beginning to develop their situation assessment. Any contradictory or ambiguous information could have been noted, so they could try to resolve it. Likewise, they could have searched for gaps in the information base, and tried to fill them. Remaining gaps or ambiguity could then be noted so that caveats could be attached to their responses, describing them as feasible under specified interpretations of the data. Later, if the factors changed (the team had been forewarned that the situation would change over time), the team could adjust their responses accordingly.

This process would also have helped them focus on an appropriate time horizon. Some of the factors required them to deal with immediate concerns (was an invasion imminent?... were chemical weapons likely?), while others needed a longer view (what's the likely long-range implication of each response?). According to the Chief of Staff, their responses did not address either of these.

SEEKING DIVERGENCE

The team was willing to surface and discuss differing opinions. However, these opinions were limited to small segments of the information. After they had explored the range of factors to be considered, the team could have sought a variety of different situation assessments and possible responses from its membership. Although one team member offered a creative response (i.e., helping Toldornia to improve their situation so aggression against Moreva didn't seem so attractive), the team didn't keep track of it or discuss it as a viable option. Later, when pressed for time, the team's memory for that response had vanished.

In this case, the team created only a single assessment of the situation. Actually, they adopted an assessment provided in the exercise materials but ignored the fact that it was identified in the materials only as one possible view. When a single assessment is all the team can produce, one tactic it can use

is to take on a devil's advocate role of challenging the assessment. For example, this team did a reasonable job of mentally simulating how Toldornia would attack Moreva. But, only three of the members engaged in that discussion. Some of the others could have challenged their reasoning during the simulation. This might have led to a realization that this particular scenario isn't necessarily the most likely one. Or, it could have led them to realize that while this scenario was consistent with the one suggested in the exercise booklet, they had never sought evidence to support other plausible ones.

The team neglected to evaluate whether members held a shared situation assessment and response. Rather, the Assistant CINC recorded his version of what the team was saying as it hurriedly tried to throw together the responses as their deadline approached. At a minimum, this should have been done in full view of the team so they could verify his summary, and so they could revise their decisions if necessary. Beyond that, a reasonable amount of time should have been set aside to discuss differences in situation assessments, and to develop one (or several) that the team agreed on, so that it could develop its responses.

Appendix C

Complete ICAF Exercise:
"America 2000"

AMERICA 2000--AN EDUCATION STRATEGY

Exercise Instructions
Lesson 13

Background

The 1992 Presidential Election is in full swing and each party is carefully responding to key issues of importance to the American public. President Bush has been under severe criticism concerning his position and track record on education. His opponents have continued to press the issue that during the last two Republican administrations, spending for education has increased over 33%, while America ranks in the bottom 20% in terms of math and science competency among the industrial nations of the world. The quality of education in the United States is not competitive with the education systems of many of our economic rivals. American employers cannot hire enough qualified workers and must allocate funds for remedial training. Many adults are functionally illiterate and as many as 25 million workers need to update their skills or knowledge. Children are entering the school systems unprepared to meet the challenge of learning. Often times they are hungry and unmotivated.

This emphasis on improving the quality of education has also been highlighted by the continued economic successes of the Japanese and Europeans. Germany, Switzerland, and Japan have continually pointed out the superiority of their education systems compared to that of the United States. They have intimated that the flattened productivity growth rate which has reduced the U.S. share of the world's markets is directly related to the poor quality of our education system. Japanese officials have postulated that American workers are lazy, undereducated, and indifferent; only out for themselves, and point to the schools and the deteriorating core family as our nation's greatest deficiencies. As further evidence they point to the poor performance of our students on international tests for mathematics and science; they link these failings to our inability to match their productivity.

As a result of this negative publicity and our perceived declining economy, education has become one of the most visible domestic issues of the election. State governments, hard hit by the recession and the declining tax base have been forced to eliminate many of the extra courses which enrich the learning experience, and to release many dedicated teachers (who will pursue other vocations). Parents and other responsible citizens everywhere are concerned and are demanding a cohesive national strategy for education.

The President's Initiative

In the last election, President Bush campaigned as the "Education President." In 1990, he unveiled a program, called "America 2000: An Education Strategy," based on six national education goals and broad strategies to be accomplished by the year 2000. In concert with the Secretary of Education, these goals (see attached), if implemented by the states and local communities, are expected to return the United States to its previous position as an educational leader in the world community.

However, there is a problem with this plan. It has made the President vulnerable to Democratic criticism that he really isn't committed to education. They claim that the broad strategies that were developed to reach these goals do not represent a sound framework, that funding for these strategies would be difficult to obtain, and that they will not return the U.S. to a position of preeminence. This vulnerability was exacerbated earlier this summer when the National Education Association (NEA) endorsed Governor Clinton, who was able to turn the occasion into a national media event. He has strengthened his candidacy considerably by identifying education as a top priority, and by making it a serious issue for the American voter.

The Upcoming Debate

The President and Governor Clinton are scheduled for a televised debate in ten days and both anticipate education to be one of the key issues. The President is concerned that his vulnerability related to education might be the pivotal issue that causes the voters to swing over to acceptance of the Democrat's platform. During a recent review of the President's policies and positions on education, his campaign staff determined they had not received sufficient analyses and information via normal channels and feared the President's ideas may be eclipsed by Clinton during the debate. A crisis mode has developed in the White House in an effort to better prepare the President for the upcoming debate. Input from several sources about a variety of specific education issues is being sought by the White House. The President of the National Defense University (NDU), as the head of one of the government's largest professional educational institutions, was identified as one of those sources. The particular issues he has been asked to consider are "choice" (i.e., parents' choice in selecting their children's school) and national testing (i.e., measuring whether students have reached competency in basic skills).

The Role of NDU

The President of NDU has decided to take advantage of the resource available here at ICAF and has tasked the school to provide him with a response to this question:

> *How can the President of the United States convince the public that choice and national testing are strategically compatible with the America 2000 goals?*

The best of these responses will be included in the NDU President's briefing to the Chairman, Joint Chiefs of Staff before being forwarded to the President's campaign planners.

Choice and testing are two of the most controversial strategies surrounding the America 2000 goals. Therefore, the White House asked that input from the NDU be developed from a variety of perspectives. The specific method that the White House and the NDU developed to ensure that multiple perspectives will be considered is to assign each team member one of the following perspectives:

- Business (from the perspective of the Department of Labor)
- Teachers (from the perspective of the National Education Association)
- Education Administrators (from the perspective of the National Association of School Administrators)
- U.S. Department of Education
- Congress (from the perspective of a recently released response to the Administration's proposed legislation about education)
- Local government
- Citizen perspective: white collar, upwardly mobile, middle class
- Citizen perspective: unemployed, under educated, community activist, welfare recipient

These particular perspectives were selected because they represent a broad base of views on America 2000 goals, and on the strategies of choice and testing. Some of the views oppose and some favor the strategies and goals. It is the Administration's hope that by exposing these opposing views during your decision

making session, the responses you develop will be acceptable to a large portion of the American public.

Your responses must have minimum risks, as they will be an integral part of the President's re-election platform, yet they need to be innovative and exciting to the American public. Your responses should be strategic in scope and should apply across issues that relate to choice, testing, and the America 2000 goals. These responses are due back to the President of the NDU the first part of next week, so that he may brief the White House staff in enough time for them to prepare the President.

While staff at the White House are aware that they have asked for a very short turn around time, they are confident that the available time will be adequate. Further, they believe that each team should use the "one-hour burst format" (a concentrated one-hour work session). This burst format is a preferred style within the Administration--they frequently task ad hoc teams to use it and find that it is very effective.

Maximum effectiveness does require that you prepare by reading and thinking about the perspective you will be asked to represent during the work session, and by reading about the other perspectives that your team members will be representing during your discussion. Your job is to be sure the team gives adequate consideration to the perspective you represent. You are not expected to convince everyone of each point or concern contained in the perspective you are representing. Rather, the team should deal with the reality that various constituencies do hold these views, and that responses you develop which cannot accommodate each view carry a cost. Therefore, be prepared to advocate the perspective you represent, but do not assume you must be unbending in this pursuit. Trade-offs will need to be made.

In summary, your role during your team decision making session is composed of two parts:

1. to represent the perspective you were assigned;

2. to identify strongly with your fellow team members in your shared objective of producing an excellent team response to the President's request.

Additionally, you should be aware that there are two agendas in effect for this lesson. One is to produce a response to the President's question. The other is to use this opportunity to practice the key team decision making behaviors discussed in Lesson 11 while you are engaged in this decision making task. In this exercise

methodology is as important as the result. So, for example, it is important to monitor for members' engagement in the team task and to adjust where necessary to ensure everyone's involvement. Likewise, your team decision making will be enhanced if you are able to detect gaps, contradictions, or ambiguity in the information base that the team is working with, or in the assumptions the team is making about it. These are but two examples--all of the key behaviors discussed in Lesson 11 will be important for your team's success.

Your seminar will break into two teams. A leader will be designated for each team by your instructor. The leader will not be required to represent a perspective. If you have only seven, rather than eight role-playing members on your team, then the Congressional perspective will be omitted.

Each team will work for 1.25 hours. Then, after a break, the class will reconvene. Each team will briefly present its responses to the President's question. Then, the teams will review their team decision processes in terms of the model of Advanced Team Decision Making.

THE NATIONAL EDUCATION GOALS

By the year 2000:

1. All children in America will start school ready to learn.

2. The high school graduation rate will increase to at least 90 percent.

3. American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

4. U.S. students will be the finest in the world in science and mathematics achievement.

5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

6. Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

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United States Department of Education Perspective

Following is an excerpt from a DOE summary concerning their involvement with America 2000.

We have the primary responsibility for implementing the strategy associated with the six education goals. We have identified these primary themes in the strategy:

1. Creating better and more accountable schools for today's students. This theme embraces the concepts of standards and assessment in a set of curriculum areas (e.g., math, science, history, etc.); improved decisionmaking at the school level; choice of schools, whether public or private, by parents in contrast to the current practice of assignment by geographic boundaries; and incentives for the improvement of teachers and school leaders. We would propose the establishment of a National Education Goals Panel to develop world class standards for each of the five core subjects. These standards would be tested in a new (voluntary) nationwide examination system whose results would be used by universities and industries for admission/hiring criteria. We would propose a system of national and state report cards on how the educational institutions are doing. Congress will be asked to authorize the National Assessment of Educational Progress which will regularly collect these report cards and tell parents and voters how well their school is doing. Choice of schools is essential as it gives parents and voters the leverage necessary to change a school that is not meeting the national standards. New incentives are necessary to encourage schools to adopt these policies.

2. Creating a new generation of American Schools for tomorrow's students. This theme embraces the concepts of R&D through a combination of business/industry, universities, think tanks, etc., into what makes good schools; the creation of a set of experimental schools which would demonstrate the best practices in education; enrolling every American community as a part of the effort to increase public awareness and support of the improvement of education; the commitment of America's leadership community--corporate, political, intellectual--to address the problem; and, finally, the designation of families and children devoted to learning. We would recommend the development of a Merit Schools Program. Congress will be asked to enact a new program that will provide federal funds to states which can be used as rewards for outstanding performance. We support the establishment of Governors' Academies for Teachers and School Administrators to assist them in developing the systems necessary to meet the national standards. Included in this is merit pay for our outstanding teachers.

3. Transforming America into a nation of students. This theme embraces the primary concept that learning is a lifelong activity that begins before formal schooling starts and continues through work experience and even into old age. As sub-themes,

there are notions that deal with setting standards for job skills, training and retraining of workers, and adult literacy.

4. Making our communities places where learning will happen. This theme echoes some of the themes in #2 by reinforcing the primacy and role of parents in the education of their children, and by bringing to bear the full social service resources of a community on problems that are part of the school. Business and labor will be asked to adopt a strategy to establish job-related (and industry-specific) skill standards, built around core proficiencies, and to develop "skill certificates" to accompany these standards. We support the development of Skill Clinics in the communities which will promote one-stop assessment and referral services for those seeking additional educational opportunities. We also propose establishing a National Conference on Education for Adult Americans.

KA9921

The National Association of School Administrators Perspective

As an organization that represents the interests of school administrators--superintendents, principals, and the like--we clearly support the administration's goals for improving schools. On the other hand, our report card for the schools gives higher marks on the general condition of education than does the Administration's position. Nevertheless, we are pleased that the Administration is supporting increased awareness of the problems in America's schools, and is finally doing something about taking a leadership role.

Each of the goals has value. We are, of course, most interested in Goals 2, 3, 4, and 6, and our organization, in concert with other national associations, such as the National Association of Teachers of Mathematics, has already implemented curricula which we feel will dramatically improve the teaching and learning of mathematics throughout the schools.

We do have some concern about two of the strategies that the Administration has chosen to implement the goals. Those strategies are: better and more accountable schools, and a new generation of American schools. Our position on each of these strategies follows.

With regard to the first strategy--better and more accountable schools--we agree that schools can be better and that they should be accountable. By accountable, we mean that administrators should devise the best program possible and see that it is implemented in the schools by teachers who are qualified and prepared to teach using efficient techniques and state-of-the-art materials and equipment. Despite this we know that some students will fail to understand the material or in one way or another will not take advantage of the opportunity to learn. The Administration's strategy suggests that as pupils, and implicitly as the schools fail, the solution is for parents to take the children to schools that have proven to be effective, to a competitor, so to speak. The plan, usually referred to as CHOICE, provides a voucher to parents which they can use to enroll their child in any school that seems to best meet his or her needs. This needless competition will spawn a whole new bureaucracy to manage the disposition of vouchers, to transport children to the school of choice, and to provide information about school programs that parents would need to make a decision. Without extraordinary safeguards, we think that such a program will unnecessarily impugn administrators and others in school systems, with a great deal of shopping for the best value (read, passing grades), and will destroy morale in existing schools.

Further, we fear that choice will lead to a two-tier educational system: one for the wealthy, and one for the poor. We are concerned that noted educators and critics of choice, like Jose Cardenas, may be right when they say:

> "Choice is based on the assumption that a free market place will lead to the selection and utilization of those schools which are successful and the atrophy of those which are not. The kneejerk support which this methodology has received in the absence of performance information is amazing. The models which are widely utilized in support of choice are mostly untested, what little evaluation has been done relies on deplorable research methods.
>
> Existing models assume that all students have the wherewithal to make their choice a reality. Factors stopping them include:
>
> 1. Lack of funds to make up the difference between voucher and tuition
>
> 2. Transportation of kids and also for parents to be involved in the school. There will be a mass exodus of middle and upper classes--we will have a dual education system."[1]

We are also concerned that schools might become mono-cultural enclaves in a time when our society is increasingly diverse and needs to understand all of its constituent parts. We agree with Harold Howe when he worries that American society is increasingly diverse; we have an immense problem making that social diversity work. The important role of the school in that task (in America 2000) isn't even mentioned. How schooling can become multicultural is not an easy question to answer, but a national plan for education that doesn't even raise the question lacks reality.

We also share Howe's concern about the impact that Choice could have on the profession of teaching. We wonder if he is prophetic when he writes--

> "I am strongly opposed to Choice as the main instrument to produce quality in schools. I believe that most teachers can be motivated to serve children well because they are committed to children's well-being. But shifting the basis of that commitment to the competitive motives that operate between Pepsi Cola and Coca Cola will diminish teachers' reach for standing as a profession."[2]

Our concerns about the second strategy--a new generation of American schools--are as follows: First, we think the notion of setting up a new generation of American schools will dilute existing schools by unnecessarily taking away financial

and human resources that could otherwise be used in existing schools. It does not seem wise to spend more than one-half billion dollars to start new schools over the next five years, when the same funds could be applied to solving some of the problems that already exist and whose solution would lead to the fulfillment of the America 2000 agenda.

Second, there is ample evidence already that pouring money and effort into creating innovative new schools that can serve as models for others to emulate is a bankrupt idea. Reviews of the education literature show an extensive array of successful new school programs in every sector of the country and for every segment of the population. During the past decade we have been thrilled by reports of school success among students deemed uneducable in traditional programs. Therefore the proposed new (innovative) schools will probably be extremely successful with the students they serve.

But, there's a problem in transferring the success to the traditional school campus--research found that no school operating a successful project was successful in transferring success to a regular school program. Why? Because the three elements found across all the
successful projects can't be expected to automatically transfer to these schools. The elements are:

1. Children were valued in ways not common in regular schools

2. Students were provided support services not commonly found in regular schools

3. There were unique relationships among the school, the community, and the family not commonly found in regular schools.

In conclusion, we think we can work with the Administration in fulfilling the goals of America 2000. But we think that these misperceived strategies should be abandoned; they simply seem to distract from the more laudable aims that the Administration seeks to accomplish.

1. Cardenas, J. A. (1991). Widening, not narrowing the gap. In Voices from the field. Washington, DC: Wm. T. Grant Foundation Commission on Work, Family, and Citizenship *and* Institute for Educational Leadership.

2. Howe, H. (1991). Seven larger questions for America 2000's authors. In Voices from the field. Washington, DC: Wm. T. Grant Foundation Commission on Work, Family, and Citizenship *and* Institute for Educational Leadership.

KA9921

National Education Association Perspective

Following is the analysis of America 2000 released in December 1991 by the National Education Association (NEA).

In April 1991, President Bush announced America 2000--his Administration's strategy to move the nation toward meeting the National Education Goals. Some have hailed this initiative as an important and strategic shift in federal involvement in education. Others view the plan as a hollow and seriously inadequate proposal which avoids the real issues confronting our nation's school system.

The three major themes in the proposal are:

1. The development of innovative school models through the New American Schools Development Corporation (NASDC), a nonprofit, corporately funded creation of America 2000,

2. Choice and the privatization of education; and

3. Standards and testing.

The Administration's language describing this initiative presents it as populist crusade while the programs themselves belie this. America 2000 embraces the idea of bottom-up action to improve the schools. Yet its main approach is both top-down development of tests and school improvement prototypes and also the continuing promotion of school choice as a magic bullet.

The Public Relation Aspects of America 2000

The White House hopes that America 2000 will counter the inattention and low priority that President Bush has given to education, despite his rhetoric about wanting to be the "Education President."

The White House and the Department of Education have engaged in an aggressive public relations strategy for packaging and selling America 2000 in this year before the Presidential election.

America 2000's broad grassroots message is appealing. The message is simple: the federal government can serve as a catalyst for change but the fundamental work must be done community by community through the involvement of all primary stakeholders. Consequently, it provides a banner under which any number of Governors, legislators, and other politicians can call attention to education

without necessarily doing anything substantive to assist schools. Some of these state and local leaders will honestly seek to leverage positive changes using the America 2000 packaging. Others will simply use it for political brownie points.

Funding--Yes, We Have No Bananas

Few would argue with America 2000's call for community involvement. But while it calls for communities all over the nation to declare support for the National Education Goals and to develop strategies to achieve them, America 2000 will provide little help from Washington in getting those strategies off the ground.

The Administration's package does not address how fiscally strapped school districts are to find the funds to implement their strategies. Instead, it offers this touchstone of conservative mythology, ". . . both state/local and federal spending have increased dramatically in recent years without significant results...Excellent schools...don't have to cost more than mediocre ones. Nobody says education is free, but ingenuity, commitment, and accountability matter more than money." (America 2000 Sourcebook, Department of Education, 1991)

Taken at face value, the rhetorical embellishments of America 2000 could convince some people of President Bush's intent to revitalize our nation's schools. Yet the Administration again and again says that money is not the answer and that we as a nation (read: state and local governments primarily) already spend great sums on education. Instead, the President and Education Secretary Alexander imply that there is an inverse relationship between funding increases and performance.

This argument obscures the obvious reality of the Administration's fiscal approach to its other priorities--savings and loan bailouts, war in the Persian Gulf, and the strategic defense initiative. Would money have been considered beside the point when discussing these matters?

What is Right with America 2000?

- America 2000 focuses the country's attention on the importance of education and the need for school improvement.

- The President's proposed strategy to achieve the national education goals subtly expands the federal interest in the quality of schooling beyond research and into development. Though this interest in school quality is positive, there are many who claim that it comes at the expense of a long history of federal concern for equity.

- The design teams awarded funding by the New American Schools Development Corporation (NASDC) may result in some new collaborations from which positive outcomes may emerge.

- The models developed by the NASDC design teams and their subsequent trial implementation will further increase the variety of school improvement models at our disposal.

What is Wrong with America 2000?

- This initiative completely ignores the manifest financial crisis of the majority of American schools which is seriously undermining efforts to maintain the current school program let alone move on new school improvement strategies.

- Given the case made for an overwhelming national interest in education improvement, there is no comparably serious thought given to what the federal role should be as opposed to what it traditionally has been. Every effort is made to underscore the state and local responsibility for funding education in order to keep the Administration off the hook.

- America 2000 does not address the first of the National Education Goals--that children will enter school ready to learn.

- America 2000 gives little to no attention to the overwhelming needs of our poor urban schools or indeed to disadvantaged students anywhere.

- America 2000 does not move toward a practical vision of how every school can have sufficient resources to make it a school of choice.

- America 2000 advances the myth that there are insufficient models for school improvement. There is in fact a plethora of such models. It is misleading to suggest that brilliant New American Schools models can be reproduced at schools throughout the nation without the serious groundwork that must be done to make a model work effectively for each school. Models are possible ways to expand thinking. However, they don't incorporate the extra time, effort, and money required to create ownership and understanding of new directions.

- Despite its recognition of the primacy of school-level change, this initiative does not recognize the broader need for systemic change at the district level and above.

- Awarding funds and other privileges on the basis of test scores creates negative and dangerous incentives. Tests then become a distorting influence in the school rather than a measure of the degree of serious learning that takes place.

- The testing features of America 2000 hold no strong promise for improving schools. Despite the initiative's endorsement of a bottom-up strategy of school reform, the tests are likely to be one more level of top-down requirements layered onto existing school programs. Moreover, educators are unlikely to get test results in time to meaningfully integrate them and alter the school program to reflect what they learn from the results.

- The investment in developing new tests to be used on an extensive basis is a costly undertaking. If results are to be widely used by employers and postsecondary schools, they must be given to every high school senior as well as to fourth and eighth graders as described in the initiative. To keep expenses down, it is likely that they will be strictly multiple choice tests and will have limited use in leveraging the curriculum towards nonpassivity, critical thinking, and creativity.

- There is no indication of how the models developed by the New American Schools Corporation will be disseminated to the majority of schools in the nation or how they connect to current government and private sector financed R&D efforts.

- America 2000 blurs the discussion of choice with privatization of education. Clearly, the initiative promotes both. Choice is again offered as a magic pill, obscuring the difference between its superficial appeal and the serious work of school improvement that results in a choice worth having.

- There is no attention to the extensive professional development required to equip current classroom teachers with the skills they need to be active participants in the redesign of their own schools, including curriculum redesign and learning how to incorporate assessment in a continuous school improvement approach.

Conclusion

In sum, America 2000 does not supply the strong federal leadership which addresses the question of an adequate and equitable distribution of resources and broadly available, long term support for quality schools which, in conjunction with state and local efforts, could make real improvements in America's schools an attainable goal.

KA9921

Citizen Perspective: White Collar, Upwardly Mobile, Middle Class

Bob holds conservative views about most issues. He has a basic passion for education. He never went to college, choosing instead to stay with the same job and work his way up. He is now sales manger for a small manufacturing firm, located in Dayton, OH. He is white, 35 years old, with two children in the third and sixth grades. His wife, Ellen, is a homemaker.

Bob doesn't believe that his children are getting a good education because he sees a lot of problems in schools--drugs, discipline, truancy, etc. He thinks that he is a good role model for his children, as an upstanding citizen, but sees this good influence undermined by the problems in the schools. He feels that since he pays his taxes, his kids should get a good education in return.

He is a member of the PTA and gets to the school board meetings pretty often, but he is tired of hearing school officials respond to every complaint with whining that their hands are tied by bureaucracy. As a concerned parent, he has read some suggested readings, from a list put out by the PTA.

Bob's motto is "Don't throw tax dollars at the problem." He firmly believes that the less money spent the better. He read somewhere that more money doesn't equal better students, and he agrees with that. From his reading, he knows that there are respected educators with views similar to his own:

> "The temporary pain relievers that the federal government has been offering to America's schools are doing little or nothing to heal them." --John E. Chubb[1]

> "A few more adopt-a-school projects, and a few more add-on grants to run drug intervention programs are not going to turn schools around--or even get their full attention." --Sid Gardner[2]

Bob is a strong supporter of a small government. As a taxpayer, he would like to cut the bureaucracy down to a minimum, and eliminate many programs which he feels are unnecessary and use the extra money to work on the deficit. He opposes programs which are going to add to the already overwhelming deficit and which will serve as an excuse to increase taxes.

> "In an important way, federal programs may also be making the schools' ailments worse. The scores of elementary and secondary education statutes now on the books have become longer and progressively more detailed (Chapter 1 is 15 times lengthier today than when it was enacted in 1965), and their implementation has stimulated impressive growth in education bureaucracy at the state and local levels. This growth has further weakened the organizational coherence and vitality of schools, and the bonds among school,

> parents, and communities. Young peoples' educational experience has become fragmented, and the lines of accountability have become further complicated." --John E. Chubb[3]

> "Nor perhaps is it necessary to funnel public monies to private schools to engender the educational innovation and parental choice that the President seeks." --Thomas Toch[4]

Bob also supports the idea of competitive schools, and he thinks that choice is the way to achieve a competitive spirit in the schools. As a strong supporter of the democratic, capitalistic way that makes America great, he feels that competition leads to a better product, and he wants only the best for his children. He would love to send his children to the city's best schools, or even to a private school that is now totally out of his reach. Only the best schools will survive in a competitive marketplace, he feels, and those are exactly the ones we want.

In addition, Bob feels that it is ridiculous for the President to appoint educators to come up with a prototype for the "New American School" when so many educators have already come up with many innovative ideas. He also has heard of several successful alternative public schools that were established but were never developed or expanded. They remained single schools, with a different curriculum that helped some students learn. He thinks that most schools aren't that bad, and many are quite good, and he doesn't understand why the President is going to put aside all that they have learned.

> "The President says he wants business-backed research and development teams to 'reinvent the American school.' What is worrisome is his strategy's apparent disregard for the many instructional innovations that already have shown success. *America 2000* mentions some examples of these instructional innovations. James Comer's program for disadvantaged students and Henry M. Levin's 'accelerated schools,' for example, are cited. However, instead of building on these foundations, the President wants to 'unleash American genius' in totally redesigning schools. Why doesn't President Bush *concurrently* provide incentives for expansion of these exemplary programs rather than rely *exclusively* on the development of entirely New American Schools? In my view, there is a contradiction in recognizing successful models, but targeting federal dollars solely to develop a new generation of schools." --Gerald N. Tirozzi[5]

> "It is wrong-headed to suggest that the greatest problem in education is not knowing what to do and that we must wait for privately-funded design teams to come up with ideas. There are many good ideas already in practice, including those championed by Ted Sizer, James Comer, Bob Slavin, and many others. Our problem is learning how to shepherd these ideas through unwieldy bureaucracies to principals and teachers in every school, people who are just beginning to believe they can take charge of their professional lives and their schools." --Michael Timpane[6]

Bob would be appalled if he thought his children might graduate from high school without being able to read. He feels that no child should graduate from high school without being at least competent in basic subjects needed to be a functioning member of society, and that the key to achieving competency is testing. He believes that testing can be an incentive to get students to the level they should be, based on a success story in Florida following a national testing program.

In the early 70's, a minimum competency functional literacy test was given to 17 year olds all over the nation. In 1975, 12.6% were illiterate and 44.4% semi-literate. Among black students, more than 40% were illiterate and more than 80% semi-literate.

> "The Minimum Competence Movement's key demand was that *no* student be given a high school diploma without first passing a test showing that he could read everyday English and do simple arithmetic. Most experts (felt that) ...requiring a passing grade on a test for a high school diploma could not possibly solve the problem of illiteracy because it would not even begin to deal with any of the underlying factors that caused it, factors like low self-esteem, poverty, family breakdown, cultural disadvantages and of course racism, not to mention poor schools, inadequate teachers, and lack of appropriate educational content, methods, and resources. It was a totally ineffective way of trying to deal with academic failure.... The students who would be hurt the most, experts said, were minority students. Disproportionate numbers of them would fail the test and be denied high school diplomas. That would stigmatize them for life, do severe damage to their self-esteem, and close off all further academic and career opportunities...."
>
> ...On the first few tries, 80% to 90% of Florida's minority students failed the test. But they were not crushed, as experts predicted they would be, and they did not give up and drop out in droves without diplomas. They kept trying....(and) by the fifth try, better than 90% of them (passed the test).... The new graduates were, by and large, the same students who had failed the test on their first few tries; the dropout rate did not go up. The teachers were

> the same and the test was too; it did not get easier... and none of the other presumed causes of poor academic performance changed either, at least not for the better. Poverty, cultural clashes, and racism remained very real problems; family breakdowns increased, to frightening levels. So did crime. These were, after all, the years when the hard-drug epidemic burst on the scene. Florida's students somehow managed to surmount all that. They wanted their diplomas, knew what they had to do to get them, and they did it." --Barbara Lerner[7]

Bob believes very strongly in the value of community. He feels that supportive parents, teachers, neighbors, and friends are the key to improving education. A community is made up of individuals who care about one another, and therefore will help each other in times of need. Building a strong community is the key to building better schools, Bob thinks. If students see good role models in their community, they will be more likely to emulate them. He believes that a community-initiated effort will work better than a program imposed by the government. He feels that the energy has to come from the community to change the community. But, he worries that choice, which he supports, might lead to a disassociation between communities and the schools within them.

> "For schools to become meaningful forces in these children's lives, they will have to become meaningful to parents, and re-establish the positive sense of community and neighborhood allegiance characteristic of schools in stable communities. Thus, the school must be reconceptualized not just as a human services center for its children, but also as a neighborhood resource for its adults." --Joan Lipsitz[8]

> "Creating and sustaining forums in which communities discuss what they can do to develop the best schools in the world might well be the best contribution to come from *America 2000*. This is a wonderfully democratic activity which should benefit the students in numerous ways." --William W. Wayson[9]

Bob thinks that it is important to hold the teachers and principals accountable for the job that their students do. If they feel some personal responsibility for the way that their students perform, they will have a vested interest to work harder to make sure that their students succeed. This also includes better training for teachers, and a more regulated teacher certification program.

> "An important lesson from the past is that we cannot improve the quality of the schools without improving the ability of the teachers in them...

> The President's goals call for accountability. Accountability requires greater, not less, professionalism. Professional accountability requires creating rigorous standards which those who practice in the field must demonstrate that they have met."
> --Arthur E. Wise[10]

Bob wants the schools of America to be in good shape for his children and grandchildren. By building a sense of community, by holding teachers accountable so that they give their all for their students, an environment can be built which is conducive to learning. Decreasing bureaucracy and size of government, and addressing the educational issues instead of "throwing money at the problems" will help the economy and ensure that there is more money to expand the already tried alternatives to traditional schools. Using tests which stress basic competence and preparedness for the "real world," and encouraging parents to choose the best school for their children, will involve both the students and their parents in the process of education, will ensure that students get the best education available, and above all, will come out educated enough for today's society.

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Local Government Perspective

Two of the organizations that provide a voice for the nation's cities are the National League of Cities (representing chiefly smaller, rural, and suburban communities) and the U.S. Conference of Mayors (representing mainly larger, central cities). Neither organization has produced an in-depth response to "America 2000." Nor has either of them produced a comprehensive policy regarding the health and future of the nation's education system in general.

This in no way reflects a lack of interest on the part of urban cities in the educational system that serves them. They are acutely aware that the quality of local schools heavily impacts their ability to attract new and retain existing business and industry. This is key to these cities' economic viability, since the business sector provides the tax base they require (both from the businesses themselves and from the workers employed there), as well as income for the citizenry which spawns related commerce.

The ability to maintain a healthy business and industrial base is a major concern of all cities in these times of economic instability, high unemployment, and the loss of jobs due to increased technological mechanization and the migration of American industry to other countries. In fact, in a recent survey, the most frequently mentioned issue that city officials generated when asked what the schools could do for them was to improve the perception of their quality in the eyes of business and industry.

But, the reality is that local boards of education are separate political entities from local governments. And, while there is considerable variance across the nation in the degree of cooperation between the two in any one location, in most communities, there is very little coordination of related service delivery systems, in joint program financing efforts, or in planning for the community's future.

Part of this is due to the fact that both systems--city government and the school district--feel they have all they can handle just to meet minimal service standards for their respective constituencies. Another part is due to genuine rivalries that exist in some locations between elected officials of one system versus the other.

There has been some national leadership in speaking out for cooperation. The U.S. Conference of Mayors adopted a resolution in 1990 that "calls on the nation to recognize the necessity of addressing its social problems, such as drug abuse, poverty, joblessness, illiteracy, hunger and homelessness, if it expects to achieve the National Education Goals (expressed in America 2000)... the Conference of Mayors will work in cooperation with other national organizations to bring together all of the different sectors to determine how they can best address local educational needs and will work in cooperation with other national organizations to facilitate achievement of the National Education Goals."

Yet, this attitude has not filtered down to very many of the local governmental or school officials. Schools feel dumped-on by a failed urban policy and by local governments that expect them to solve these problems on their own. They are being asked to educate students who arrive at their doorstep hungry, tired, and emotionally distressed from the difficulties of homelessness, life in the ghetto, poor parenting practices, and the like. Most believe they have been unfairly blamed for the high drop-out rates, lower standardized test scores, disciplinary problems and unsafe schoolyards--these are products of a culture of poverty, not of old fashioned and unresponsive educational practices. The schools are looking to local government to address these needs--to develop low-cost housing, to improve and expand social services, to reduce the crime rate and to increase the job base, so that students can arrive at school ready to learn and can believe that a good job awaits them if they apply themselves.

In general, city governments recognize that for the very poorest students, schools will be hard-pressed to meet <u>all</u> their needs. The idea that schools should do whatever is necessary to fulfill their mission of educating <u>all</u> children in their community seems extreme. Yet, an increasing number of city officials are expressing the view that their school districts should be proactive about problems that are not about education per se, but that impact the ability of children to learn. They cite the growing proportion (20% and rising) of students whose families are below the poverty line and who come to school ill-prepared for learning...a constituency that must be served by their schools. Will the schools write-off this group and become no more than a daycare facility for them, endlessly promoting students through the grades and graduating them without marketable skills? Will they create yet another generation of unemployable people who demand more and more of the nation's wealth, and who escalate the crime rate? Or will they adopt standards and routinely test students before passing them to higher grades? And, for those students who are left behind, will schools develop alternative programming to train them for rewarding employment? In short, will they cling to their identity as an academic stronghold, or will they begin to see themselves as a neighborhood resource?

Cooperation among city governments, social service agencies, and schools is one thing. Devising plans to cope with the host of problems afflicting the urban poor, as they relate to the ability of schools to educate our children is quite another. Here are some grim facts:

- More children live in poverty than any other age group including the elderly, and are worse off now than they were two decades ago.

- Our schools are more culturally diverse now than at any other time since pre-World War II.

- Disparity between the wealthy (or comfortable) and the poor is greater now than at any other time since World War II, and is still growing.

- Black and Hispanic children are two to three times more likely to be living in poverty than are white children.

- Median family income of white children is two times higher than that of Blacks, and more than 1.75 higher that of Hispanic children.

- Awareness about the disparity in life-style between rich and poor (via television) is greater now than at any other time in history.

- Cities are being called upon to provide more and more social services and housing for their citizenry with fewer and fewer tax dollars as federal support has been drastically cut over the last ten years.

- The drug culture continues to be an attractive life style to young men who see no real career alternatives, and for whom education seems irrelevant.

- The rate of teen pregnancy continues to rise with an 8% aggregate increase since 1986, and more alarmingly, for teens 15 and under, the increase rose by 44%. Fifty percent of pregnant teens drop out of school.

Early intervention programs continue to be high priorities for cities. A policy adopted in 1991 by the U.S. Conference of Mayors urged Congress to provide direct funding to urban areas for a variety of programs like preschool and early childhood education. They also asked that Head Start be changed to an entitlement program that will serve all eligible children, instead of the 25% it now supports. They pointed out that Head Start not only offers a valuable start on education, but it also explicitly involves the community as a whole and the attention of other social agencies that are already poised to support the family in parenting skills, health care, basic education for an unschooled parent, job counselling, and the like.

The problem is that all of these agencies will require additional resources in order to meet increased demands that will be made on them if all eligible children are served by Head Start. Further, not every community across the nation has existing agencies or programs designed to meet all these needs--these communities will need resources to create and augment their social services infra-structure. Yet, the federal deficit continues to grow, and the "peace dividend" from a reduced military that is so frequently identified as the source of new funding is being stretched beyond reasonable limits.

Further, city officials know they are competing with suburban and rural communities for federal support of programs affecting their schools. Education-related problems in these communities are much more tractable and can appear to provide a bigger pay-off to the average voter. For example, a request for federal funds to purchase equipment necessary for technological-skills training can stand on its own, and can produce high school graduates who are ready to enter the job market and begin contributing to the tax base. The proposal does not need to be accompanied with a funding request for supplementary services to keep the students in the program (they're fairly well motivated), to upgrade their basic math and reading skills (their skill level is acceptable), to counsel students in finding and keeping a job (their parents and peers will help with that), etc. To the voter, this proposal looks like priming the pump, not like throwing money down a bottomless pit.

Last, the issue of choice in schools continues to be hotly debated. Will choice and free market incentives make all schools more competitive? Or, will choice leave the urban schools unfairly burdened with a difficult student population? One whose parents do not recognize the value of education to their children's future? Whose parents don't know how to shop for schools, and who cannot afford to transport them anyhow?

Congressional Perspective

The President has submitted legislation consistent with the goals of America 2000. It centers around three ideas: assessment involving national tests of school children, the funding of some experimental schools, and parental choice of public or private schools. The Congress recently released their response to the President's legislative proposal as follows:

a. Assessment: The Congress acknowledges the necessity of creating a system of evaluating national standards and has been supportive by creating a council to deal with standards and assessment. While the Administration is taking steps to begin the development of standards, the Congress is holding hearings on standards and assessment. The outcome of the hearings has been a movement in the House to back away from national tests. The urban superintendents quake at the idea of national standards testing and the House has had to listen to their vocal constituents. Instead of national tests the House Education and Labor Committee calls for the development of "school delivery standards"--what schools need in order to perform their mission adequately. The bill doesn't propose to help schools deficient in resources; it merely seeks a national checklist: Are the teachers trained, are there enough textbooks; is there a school library; etc.? There will be some contentious issues in both standards and testing relating to what to teach and how to measure the success or failure of teaching.

b. New Schools: The President asked for $535 million to fund new and experimental schools across the country over the next five years; the Congress thinks this is too little and too long (less than one percent of American schools would be improved in five years). Their program is to provide the same amount of funds to states, and using Total Quality Management (TQM) principles create systemic reform in all school districts within each state through a concerted effort on the part of educators, businesses, parents, and the community at large. The House is opposed to the Administration's focus. "It's all cliches and show business," according to Rep. William Ford (D-Mich). Instead, the House proposed a bill that authorizes $700 million in the first year for such things as state curriculum frameworks and teacher training. The bill clearly demonstrated the House's resolve to keep the educational programs' decisionmaking at the state and local level and their emphasis on a program that is equitable to all their constituents and not just a select few. The teachers' unions and lobbyists have persuaded the House to veto or block any legislation that would encourage any form of a competitive grant program, in which money would go to schools whose innovations boost academic performance.

c. Choice: The Congress has not embraced this aspect of the President's program, primarily because of the inclusion of non-public schools in the equation. Thus, it has earmarked no funds for choice. If individual public school districts make choice part of their project, that is their option, but the subject of parental choice is a strong area of disagreement between Congress and the President. The House feels that the education system must provide the educational needs of all the people, not just those wealthy enough or concerned enough to have the facility to transport their children to schools out of their

locality. They are most concerned with the impact this initiative would have to the inner city schools.

Congress also diverges from the President's proposal in another area. It believes that more funds should be put into tried-and-true programs, such as Head Start (which would support Goal #1 of the America 2000 Project). Head Start has proven its success in terms of providing opportunity for inner city children but because of reduced federal spending, especially during the Reagan years, it has seen smaller and smaller budgets. Congress feels that mature programs such as this deserve funding at the expense of experimental initiatives.

KA9921

U.S. Department of Labor Perspective

While the President, through the Department of Education was preparing to issue America 2000, we at the Labor Department have been pursuing our own initiatives on how schools prepare young people for work. Our concern was that more than half of our young people leave school without the knowledge or foundation required to find and hold a good job. Low skills lead to low wages for workers and low profits for business, a condition that is not desirable from any perspective, and one that is troubling when the United States looks at the global economy in which we now find ourselves.

The Department of Labor is launching a full range of activities in support of President Bush's Six National Education Goals, a strategy that calls for the United States to become a "Nation of Students". These activities, all slated to begin in the Spring of 1993, form an Economic Growth Agenda for the Department. The various efforts are complementary and designed to create a job training and education system for the 21st century to ensure that the American worker is the best skilled and most productive in the world.

A "Job Training 2000: Legislative proposal", developed under the leadership of the Department of Labor, will streamline and simplify access in communities across the country to the current array of federally supported vocational training programs. It provides for greater private sector involvement, eliminates overlap, increases individual choice in selecting schools, and establishes a certification process to ensure that only quality programs are eligible to receive Federal vocational training funds.

Under Job Training 2000 the Private Industry Council (PIC), composed primarily of private employers, would oversee and be accountable for the local delivery of services for about $12 billion from Federal programs. "One-stop shopping" skill centers would provide workers and employers with easy access to the whole array of job training services available throughout the community. No longer would individuals or employers be baffled by this complex maze of service providers in a community to obtain information on the types of services and assistance available.

Borrowing liberally from the time-honored apprenticeship concept, the Department of Labor is proposing legislation to promote the use of voluntary youth apprenticeship programs in schools across the country to improve the transition from school to work for many of our youth. The strategy offers an alternative educational approach, consisting of academic instruction, formal job training, and work experience related directly to a youth's studies. These apprenticeship programs--a key feature of which is a contract between student, parent, school, and employer--are designed to keep youth motivated, in school, and on a path that will lead to employment in high-wage, high-skilled jobs.

The Department of Labor is also undertaking a new initiative called TEAMS (Technical and Education Assistance for Mid- and Small-sized firms) that will address the training, workforce literacy, and work restructuring needs of firms of under 1,000 employees. The partnerships created for this effort will include representatives of the Departments of Commerce, Small Business Administration and Defense, selected states, and a number of national organizations, including the National Association of Manufacturers, as well as the Department of Labor.

Activities are underway to establish job-related, industry specific, voluntary, skill standards built around a set of core proficiencies. The Department will spearhead a national campaign to consider the need for these standards and to develop skill certificates as measurement devices to accompany the standards.[1] Building on work of the National Advisory Commission on Work-Based Learning, the effort includes public meetings to discuss a published "white paper" on such a system, demonstration projects in key industries, research in how to develop standards and skill certifications, and, if appropriate, proposed legislation supporting the concept.

While we recognize that schools play many roles beyond education for the work-place, we think it is important to provide students with the skills that they will need when they enter the job market. We found out three important things in our study:

1. All American high school students must develop a new set of competencies and foundation skills if they are to enjoy a productive, full, and satisfying life.

2. The qualities of high performance that today characterize our most competitive companies must become the standard for the vast majority of our companies, large and small, local and global.

3. The nation's schools must be transformed into high-performance organizations in their own right.

Given these things, we strongly support America 2000; we think achievement of each of these goals is valuable to achieving world class standards in the workplace. As we move from the world of the production line to the world of services, on the one hand, and to an international business and labor environment, on the other, the Secretary's Commission on Achieving Necessary Skills (SCANS) has identified a set of competencies, and a foundation

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[1] The Department of Labor statement does not specifically address testing in the schools as it does in the workplace. However, they have issued their support for this strategy elsewhere.

which we think would serve well the labor force and the business community. We think it should be adopted within the schools as part of their 'transformation' or restructuring.

We feel these define a common core of skills and competencies that students and workers need for workplace success, and emphasize the importance to schools and communities across the country of incorporating these definitions into curricula and training programs. A number of communities already have adopted the SCANS approach to preparing students for work through business and school collaboration. For its part, the Department has begun to incorporate SCANS skills and competencies into the training programs it administers, and is promoting the SCANS message of the need for skills improvement.

WORKPLACE KNOW-HOW

COMPETENCIES--effective workers can productively use:

- RESOURCES--allocating time, money, materials, space and staff

- INTERPERSONAL SKILLS--working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds

- SYSTEMS--understanding social, organizational, and technological systems, monitoring and corrective performance, and designing or improving systems

- TECHNOLOGY--selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.

THE FOUNDATION--competence requires:

- BASIC SKILLS--reading, writing, arithmetic and mathematics, speaking, and listening

- THINKING SKILLS--thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning

- PERSONAL QUALITIES--individual responsibility, self-esteem, sociability, self management, and integrity.

The Department will develop the data and analysis needed to issue an annual report to the nation on "The State of the American Work Force." Released each Labor Day beginning in 1993, the report will provide details on the training workers receive, their competencies, and positive examples of work restructuring efforts. The project is designed to encourage workers and the institutions that make up the education and training systems to think strategically about training.

We think that parents, teachers, and employers must all address the development and institutionalizing of these qualities in the schools so that we can prepare the next generation of workers. The Department of Labor will continue to work with the business and industrial community to develop programs for those few students who drop out of school, and to retrain those already in the work force, or those displaced from the work force.

KA9921

Citizen Perspective: Unemployed, Undereducated, Community Activist, on Welfare

LaKeesha is a single mother with three children ages 3, 9, and 16. She is unemployed and receives aid for dependent children. She tries often but so far has failed to find a job that pays enough to cover the costs of the child care and insurance she would need as a result of going off Public Assistance. A community activist, LaKeesha volunteers at her children's elementary school. The school is dull and has virtually no amenities. The first time she went in to volunteer it was difficult to find the front office, and when she found it, there were no chairs. She waited for 30 minutes to see the volunteer coordinator, standing in line with students who were not being treated with much respect either.

LaKeesha has definite attitudes and beliefs about the direction education policy should take. She attends most PTA and school board meetings and has sat on panels that were formed to gather information about the areas where change is imperative.

LaKeesha is not convinced that creating competitive schools will provide equal educational opportunity. She worries that the reliance on market forces might produce a win-lose situation, with kids of well-educated and wealthy parents the winners and people like her family the losers. Recently, an education committee on which she serves read material about this issue which included the following:

> "The Bush plan promises large impacts because the market mechanism is expected to force improvements, as parents leave weak schools and choose better ones. The argument should be very familiar because it is the deregulation argument that dominated the 1990's. Deregulation of the savings and loan industry, cable television, airlines, telephone systems, and other institutions was expected to produce huge gains in efficiency and service. There have been successes in some areas but also some spectacular failures. The S&L crisis is already the most costly financial disaster in American history. It shows that many business leaders, freed of bureaucratic control, decided to speculate recklessly with other people's money. The airline experiment has reached a point of diminishing competition, with virtual regional monopolies, deteriorated service, less convenient schedules for many travelers, predatory local pricing and other market distortions. Congress has conceded the failure of cable TV deregulation and authorized re-regulation. The romance of the self-regulated market place has dimmed considerably.
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> "The school choice debate usually ignores the other major policy areas in which a choice approach has long been dominant and where the Bush Administration is asking for more regulation. Among policies serving the poor, two of the most important are the Medicaid program, which allows people to choose doctors in the free market, and the Pell Grant and Guaranteed Student Loan programs, which enable students to choose colleges and other postsecondary education they would otherwise be unable to afford. These are multi-billion dollar programs based on choice and 'self-regulating

markets.' If Medicaid made the market work for low-income black residents on the South Side of Chicago, the quality of health care should have soared as doctors and clinics rushed in to compete for the hundreds of millions of dollars of business. Just the opposite has happened. Medical practitioners have not rushed into the area and many refuse Medicaid patients. Many hospitals and clinics have gone bankrupt and shut their doors, including the city's only black-controlled hospital. Far from efficient, low-cost service, much of the treatment is extremely expensive and highly inefficient. The system has been far more expensive than predicted, has left tremendous inequalities in place, and has produced a strikingly inferior level of care by decaying institutions. In response, Bush is proposing more cost and service regulation.

"America 2000's 'school choice' plan is particularly troubling. I believe that a public system of free and equal education is essential in a democracy. I therefore disagree with the President's 'school choice' plan, which would potentially funnel public dollars to private and parochial schools. I also question whether private and parochial schools would want public money if it meant adhering to teacher certification and other state and federal regulations. And I would be amazed if any of these institutions would accept all students, including those who bring a wide range of challenges to the classroom. I believe the only way they might accept the public dollars would be if they were allowed to continue to be highly selective in student enrollment. This selectivity would result in public schools becoming the schools of last resort. This, in my mind, would be a betrayal of the American dream of access and equity in publicly-funded schools." --Gary Orfield[1]

"It is the unfortunate case that we have many schools that no one would want to choose and many families, especially the most devastated, with few resources for choosing wisely. In these circumstances, educational choice would increase inequities in our schools rather than diminish them. Before we convert to a choice-driven program, we must make every school worth choosing, and there must be a clear indication that choice would distribute the benefits of education more equitably." --Michael Timpane[2]

LaKeesha believes that federal money should be designated to fund social programs in communities that help minorities get prepared to learn. She agrees with these conclusions:

"Both research and practical experience show conclusively that the ability of children to learn is predicated heavily on their environment--the social,

> economic, and health factors which so dramatically impact the very early years of their lives. With almost 40 percent of all children under the age of six currently growing up in poverty or in very marginal economic circumstances, any serious effort to improve education must address the growing problem of children's poverty. To do so will require new resources. Yet, the President's plan is silent on the transcendent demographic imperatives related to the core issue of poverty. Limited resources would be better spent providing universal access to Head Start, WIC (women, infants, and children program), prenatal care, and other successful intervention programs that directly relate to the crucial 'learning readiness' goal." -- Michael D. Usdan[3]

LaKeesha assists math and reading teachers in her childrens' elementary school. She does this to get a message across to her own children that she values education, and also because she senses a real need. She believes the federal government should set up a program to hire parents as paraprofessionals. This program would provide employment opportunities to the less educated. She hopes that her state will implement a parents-as-teachers program similar to the one in Missouri.

LaKeesha doesn't like the idea that educational standards are lower for minorities, however, until such time when parity is reached between the skills of upper- and middle-class whites and the skills of minority groups, she thinks standards should remain lower. Instead of raising them now, she would like to see them raised over time. She agrees with educators like Orfield who recognize that drop-out rates are increased by poor testing policies:

> "Testing proliferated during the 1980's in virtually all states, but had little effect on achievement levels. A strong re-emphasis on standardized tests began in the late 1970's, a central recommendation of the *Nation at Risk* report. Now the President wants a new set of national tests. The 1980's tests were often used to raise standards by flunking children who could not meet certain test scores, a policy that has failed to produce educational gains, increased spending for repeating the same grades of schools, and raised dropout rates." --Gary Orfield[4]

LaKeesha is personally hurt that in a government system that promotes justice for all, the United States has ignored minorities for too long. She believes this is mainly because its leadership has not been strong enough to make such a promise come true. In city schools that stand amid housing projects where students fight daily battles with drugs and death, there is little hope in solving education problems by expecting parents to encourage academic

achievement. This will help, but what they also need is more money to upgrade the physical plant and secure its grounds, to fund badly needed teacher training, to reduce classroom size, and to meet a host of other needs.

LaKeesha's school system is extremely vulnerable to unstable economic conditions, so she believes it is absurd to promote education as our greatest priority, then to continue to finance it on the least substantive and most volatile tax base we have--property taxes. It allows schools to be vulnerable to extreme local and regional economic swings--and swings in public moods--which produces constant instability.

LaKeesha disagrees with the notion that holding teachers and principals accountable for students' performances will improve education. She believes this measure will take money away from schools with atypical students. These atypical students make up a larger portion of the student population in the inner cities than elsewhere. LaKeesha feels that accountability will not solve some of the most severe problems and that direction, support, and resources are needed to address these inadequacies in existing schools. This view is echoed by educators like Jose Cardenas, who wrote:

> "Providing incentives for better performance by rewarding exemplary schools violates a basic principle of school finance. Performance is a poor basis for the distribution of resources. Rewarding high performing schools may deny resources to the entities which most need them. Providing funds for under-achieving schools may reward inefficiency and incompetence." --Jose A. Cardenas[5]

Reference List

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