

Small Group Processes For Intelligence Analysis

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Executive Summary

Intelligence analysis is increasingly a team or group effort rather than the product of a single analyst working alone. There are multiple reasons for this. Intelligence products increasingly require significant input from multiple agencies, and there is a strong need for closer interagency collaboration. The lines that separate analysts, collectors, and operators are becoming increasingly fuzzy, requiring analysts to reach out to an expanding pool of specialists even within their own agency. There is an increasing emphasis on structured analytical techniques, and all of these are usually more effective when used in a small heterogeneous group than by a single analyst. Advances in computer-mediated communications are increasingly making it easier for analysts to collaborate or “meet” while remaining in dispersed geographic locations. Motivation for online distance collaboration increases as intelligence agencies grow in size and their workforce is dispersed in more different locations. The cost in time required to attend meetings in an increasingly congested and expanding Washington, DC, area is substantial.

Consequently, the success or failure of group processes plays an increasing role in the quality of intelligence products. This report discusses what intelligence analysts need to know about group processes in order to maximize their effectiveness. Part I discusses problems that often degrade group performance. Part II discusses how to correct or avoid these problems and perform at a high level. Part III discusses the relationship between structured analytic techniques and group processes.

Some problems that impact the productivity of meetings are familiar to frequent meeting-goers. The reluctance of some participants to speak up and express their true beliefs is commonplace, and counterproductive behaviors that detract from group performance are not unusual. Academic studies show that “the order in which people speak has a profound effect on the course of a discussion. Earlier comments are more influential, and they tend to provide a framework within which the discussion occurs.”¹ Once that framework is in place, discussion tends to center on that framework to the exclusion of other options.

Development of a group consensus is usually perceived as success, but, in reality, is often indicative of failure. Premature consensus that impedes the discovery of better alternatives is one of the more common causes of suboptimal group performance. Polarization is a phenomenon with which most analysts are not familiar. It is the tendency of a group to make a decision that is more extreme than the most extreme member’s view prior to the discussion. Intuitively we would expect group discussion to moderate the most extreme positions, but “evidence from jury decisions and three

¹ James Surowiecki, *The Wisdom of Crowds* (New York: Doubleday, 2004), 184.

decades of experimental research suggest that, much of the time, the opposite is true.”² How and why this happens is described in the section on Polarization.

Improving group performance will require an understanding of these problems and a conscientious effort to avoid or mitigate them, which is the focus of Part II of this report. The literature on small group performance is virtually unanimous in emphasizing that groups make better decisions when their members bring to the table a diverse set of ideas, opinions, and perspectives. The underlying cause of premature consensus, groupthink, and polarization, as discussed in Part I, is a failure to adequately identify and consider alternative points of view. Laboratory experiments have shown that even a single dissenting opinion, all by itself, makes a group’s decisions more nuanced and its decision-making process more rigorous.³ “The research also shows that these benefits from dissenting opinions occur regardless of whether or not the dissenter is correct. The dissent stimulates a reappraisal of the situation and identification of options that otherwise would have gone undetected.”⁴ The research also shows, however, that dissent must be genuine, not generated artificially as in some applications of the devil’s advocacy technique.⁵ It should also be reasonable.

Briefly, this means the route to better analysis is small groups of analysts who speak up and express a wider range of ideas, opinions, and perspectives. This can be achieved by the formation of more heterogeneous groups, the increased use of structured analytic techniques by these groups, and the use of computer-mediated communications when analysts are geographically dispersed as discussed in Part III. Happily, this is the direction in which the Intelligence Community is now moving.

The desired diversity of opinion is, of course, a double-edged sword, as it can become a source of conflict which degrades group effectiveness.⁶ It is not easy to emphasize true collaboration and teamwork into a community with a history of interagency rivalry and mistrust. Analysts must engage in inquiry, not advocacy, and they must be critical of ideas but not critical of people. It is important that any divisive emotional conflict is addressed early, not tolerated or ignored. If not resolved, it often simmers until suddenly reaching a boil. Conflict that stems from interpersonal animosity or long-standing conflict or competition between organizational units usually has an adverse impact on group performance.

² Surowiecki, *Wisdom*, 184.

³ Surowiecki, *Wisdom*, 183-184.

⁴ Charlan Jeanne Nemeth & Brendan Nemeth-Brown, “Better than Individuals? The Potential Benefits of Dissent and Diversity for Group Creativity,” ed. Paul B. Paulus & Bernard A Nijstad, *Group Creativity: Innovation through Collaboration* (New York: Oxford University Press, 2003), 73.

⁵ *Ibid*, pp. 76-78.

⁶ Frances J. Milliken, Caroline A. Bartel, & Terri R. Kurtzberg, “Diversity and Creativity in Work Groups,” ed. Paul B. Paulus & Bernard A Nijstad, *Group Creativity: Innovation through Collaboration* (New York: Oxford University Press, 2003), 33.

As the Intelligence Community places increased emphasis on interagency collaboration and more work is done through computer-mediated communications, it becomes increasingly important that analysts be trained in the knowledge, skills, and abilities required for facilitation and management of face-to-face as well as virtual team or group meetings, including a strong emphasis on the management of conflict during such meetings. Training is most effective when it is available just before the skills and knowledge must be put to use.

It is important that this be an Intelligence Community-wide training program so that it can provide maximum support to interagency collaboration and the formation of virtual teams. Whenever a new interagency or virtual team or work group is formed, it would be appropriate to ensure that all members have the same training in the pitfalls of group processes, performance expectations, standards of conduct, and conflict resolution procedures. Standardization of this training across the Intelligence Community would accelerate the development of a shared experience and culture and reduce start-up time for any new interagency group.

The last section of Part II discusses the concept of a “community of practice” (CoP) as distinct from a community of interest. CoP members share information with others performing similar tasks in order to learn from each other, help each other, mentor new or less experienced members, and often promote changes in work processes or the work environment that enable members to perform more effectively. Participation is voluntary and relationships are collegial not hierarchical. CoPs take a wide variety of forms. It is a relatively new organizational form that, according to the *Harvard Business Review*, “promises to complement existing structures and radically galvanize knowledge sharing, learning, and change.”⁷

There are various ways that CoPs might be used in the analytic community. There might be interagency CoPs for analysts working on specific countries or subject areas, for users of a specific analytic technique, or a CoP that becomes part of a knowledge management system for structured analytic techniques in general.⁸ DoD has several years of experience with CoPs. Particularly noteworthy are the 15 different CoPs plus 24 Special Interest Areas sponsored by the Defense Acquisition University (DAU). There may be lessons learned that would apply to adapting this concept to the Intelligence Community.

Part III covers the relationship between small group processes and structured analytic techniques, including discussion of structured techniques that are especially appropriate for use by virtual teams or groups. Just as structured analytic techniques

⁷ Etienne C. Wenger & William M. Snyder, “Communities of Practice: The Organizational Frontier,” *Harvard Business Review* (January-February 2000).

⁸ This author is proposing a knowledge management system for structured analytic techniques in a separate report for ODNI/ARDA, entitled “Proposed Taxonomy and Knowledge Management System for Structured Analytic Techniques.”

provide structure to our individual thought processes, they also provide structure to the interaction of analysts within a small team or group. When such a structured technique is used, each step in the technique prompts discussion among the group. Such discussion generates and evaluates substantially more divergent information and new information than a group meeting which does not use such a structured process. For example, the discussion of assumptions, the relationships between variables, or the relationship between an item of evidence and a set of hypotheses inevitably elicits a range of perspectives from the members of a group. This helps to reduce the risk of premature consensus, groupthink, and polarization.

Based on the research findings discussed in Part II concerning the value of divergent information, one may conclude that the use of structured techniques generally improves the quality of analysis as compared with analysis by a single individual or by a group that does not use a structured process. One might also conclude that all the structured analytic techniques are best used as part of a collaborative group process.

The experience of CIA analysts using the Analysis of Competing Hypotheses (ACH) software in their work supports this view. Their preferred use of this tool is to gain a better understanding of the differences of opinion with other analysts or between analytic offices. They consider the discussion prompted by use of this technique to be the most valuable part of the ACH process.⁹ This structured process does not guarantee a correct judgment, but it does help to ensure that alternative voices are heard and seriously considered when making the judgment.

Some structured analytic techniques are particularly appropriate for use by distributed, asynchronous virtual work groups or mixed virtual and face-to-face groups. The Intelligence Community is in a good position for the use of virtual teaming. Analysts are sufficiently dispersed that frequent attendance at interagency meetings is burdensome, but not so far apart that they can't meet face-to-face when really needed.

Small distributed, asynchronous groups are particularly good at generating and evaluating lists of assumptions, indicators, drivers, potential explanations of current events, or potential outcomes. They are also good for making lists of pros and cons on any particular subject. With the aid of readily available distributed group support software, the group can then categorize items on such a list or prioritize, score, rank, scale, or vote on them. This is the kind of ground work that provides a solid foundation for further interagency collaboration. For such tasks, a distributed asynchronous meeting may be more productive than a traditional face-to-face meeting. That is because analysts have more time to think about their input; they are able to look at their contribution over several days and make additions or changes as additional ideas come to them; and, if rank or position of some group members is likely to have an undue influence, arrangements can be made for all group members to make their input anonymously.

⁹ Information provided by a senior Intelligence Community educator.

This is a more advanced form of interoffice and interagency collaboration than sharing information on a wiki or posting to a blog on Intellipedia. One basic requirement for this type of interagency collaboration is that the work group have a private, password-protected workspace on a secure network to which all group members have access. This will enable small interagency groups to work together using various structured analytic techniques without having to leave their office.

The same procedures can be used with outside experts on an unclassified network. Open source information has rapidly come to play a larger role in intelligence analysis than in the past. Combine this with a disproportionate percentage of Intelligence Community analysts having limited experience, and it suggests an opportunity and need to reconsider how we exploit the world of expertise outside the Intelligence Community. Distributed asynchronous collaboration while using some of the basic structured analytic techniques is one way to tap the expertise of a group of knowledgeable but uncleared individuals.

Part III also discusses three categories of structured analytic techniques that are intended to be used by groups rather than individual analysts, including six specific techniques that are apparently being used very little, if at all, within the Intelligence Community. These are techniques for reframing the question (Premortem Analysis), generating ideas (Virtual Brainstorming, Nominal Group Technique, Starbursting, and Reverse Brainstorming), and aggregating expert opinion (Prediction Markets and Policy or Real-Time Delphi Method). Prediction markets are not recommended, for reasons discussed in the main body of this report, while two variations of Delphi are recommended for performing a function somewhat similar to prediction markets. Premortem Analysis and the three alternative forms of brainstorming are also recommended for use by the Intelligence Community.

The Premortem Analysis technique is particularly noteworthy as it is a new technique being developed by the author of this report based on a concept initially conceived and tested by Gary Klein.¹⁰ Recent experience reminds us that significant intelligence failures are typically followed by post-mortem investigations to determine what went wrong and learn from the experience. Why not do a Premortem Analysis in advance to learn what could go wrong, and then try to prevent the failure?

In a Premortem Analysis, a group is asked to imagine that several months or years have elapsed since their analysis has been published, and they now know it was wrong. The group is then asked to analyze what could have happened to cause it to be wrong? This technique works because it triggers two creative processes. First, the questions are reframed. Asking questions about the same topic, but from a different perspective, typically elicits different responses. Second, the premortem approach legitimizes and empowers dissent from the previous conclusion. As noted in Part I, many members of small groups suppress their dissenting opinions. In a Premortem Analysis, all members

¹⁰ Gary Klein, *Sources of Power: How People Make Decisions* (Cambridge: MIT Press, 1998), 71.

are asked to make a positive contribution to group goals by identifying *weaknesses* in the previous analysis. The author suspects that a Premortem Analysis might be more effective than other challenge techniques in helping a group of intelligence analysts to identify and examine the weaknesses in their own analysis.

The concluding section of the report summarizes all recommendations.

Introduction

Intelligence analysis is increasingly a team or group effort rather than the product of a single analyst working alone. There are multiple reasons for this. Intelligence products increasingly require significant input from multiple agencies, and there is a strong need for closer interagency collaboration. The lines that separate analysts, collectors, and operators are becoming increasingly fuzzy, requiring analysts to reach out to an expanding pool of specialists even within their own agency. There is an increasing emphasis on structured analytical techniques, and all of these are used more effectively in a small heterogeneous group than by a single analyst. Advances in computer-mediated communications are increasingly making it easier for analysts to collaborate or “meet” while remaining in dispersed geographic locations. Motivation for online distance collaboration increases as intelligence agencies grow in size and their workforce is dispersed in more different locations. The cost in time required to attend meetings in an increasingly congested and expanding Washington, DC, area is substantial.

Consequently, the success or failure of group processes plays an increasing role in the quality of intelligence products. This report discusses what intelligence analysts need to know about group processes in order to maximize their effectiveness. Part I discusses problems that often degrade group performance. Part II discusses how to correct or avoid these problems and perform at a high level. Part III discusses the role of structured analytic techniques and communications technology in group processes.

Broadly speaking, two different types of groups engage in analysis or decision making. One is an information-processing group that serves as “a vehicle for combining disparate points of view, knowledge, and ideas with the hope of reaching better decisions.”¹ Most teams and working groups are of this type, and they are the focus of this report. The other is a representative body of interested parties, and the goal is “to engender acceptance, satisfaction, or commitment to decisions” that are made. Most staff meetings and committees perform this representative function. Such groups are not discussed in this report.

The minimum goal of any task-oriented group process is to perform in a manner that is better than what the average group member could do working alone. The preferred goal is a performance that is better than what even the most qualified member of the group could achieve working alone. Unfortunately, a large body of research as well as personal experience tells us that group performance often falls below minimum expectations.

¹ Garold Stasser and Zachary Birchmeier, “Group Creativity and Collective Choice,” ed. Paul B. Paulus and Bernard A. Nijstad, *Group Creativity: Innovation through Collaboration* (New York: Oxford University Press, 2003), 87

It may be useful to start this discussion of small group processes with definitions of terms as they will be used in this report.

Cooperation: In cooperation, a task is split into independent subtasks, with each of the contributing parties working separately to take on one of the subtasks, which then naturally leads to coordination to assemble the pieces together.²

Coordination: Coordination is when we tell others what we are doing, but then work independently and try to fit the pieces together at the end.

Collaboration: Collaboration is mutual learning between two or more people working together.³ It is “a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared understanding of a problem.”⁴ Dr. Thomas Fingar, Deputy Director of National Intelligence for Analysis, has stated that collaboration is central to the effort “to transform the analytic component of our community from a federation of agencies, or a collection of feudal baronies, into a community of analysts, professionals dedicated to providing the best and most timely, most accurate, most useful analytic insights to all of the customers we serve.”⁵

Group: A group is any number of people who interact with one another, are aware of one another, and perceive themselves as a group. A group may be a team, committee, board of directors, or any set of individuals assembled for a common purpose such as a social engagement, charitable function, or to meet a political candidate. This report is limited to task-oriented groups, i.e., groups formed to work together to complete a specific task. Task-oriented groups are often called teams, and the terms group and team are often used interchangeably in this report.

Team: A team is a small number of people with complementary skills who work collaboratively toward a common purpose, performance goals, and approach for which they hold themselves mutually accountable.⁶ All work groups are not teams. For example, a group that produces a product by combining individual contributions is not a team. Teams produce work that is based on the synergy of collaborative effort.

² P. Dillenbourg, M. Baker, A. Blaye, & C. O'Malley, “The Evolution of Research on Collaborative Learning, ed. P. Reimann & H. Spada, *Learning in Humans and Machines: Towards an Interdisciplinary Learning Science* (London: Pergamon, 1996), 189-211.

³ Merriam-Webster Online dictionary, www.m-w.com; Compact Oxford English Dictionary, www.AskOxford.com.

⁴ Dillenbourg, Baker, Blaye, & O'Malley, “Evolution of Research.”

⁵ Thomas Fingar, Speech to The DNI's Information Sharing Conference and Technology Exposition, Denver, CO., August 21, 2006. Available at www.dni.gov/speeches/20060821_2_speech.pdf.

⁶ Jon R. Katzenbach and Douglas K. Smith, *The Wisdom of Teams* (New York: Collins, 2003).

Virtual Team or Group: Virtual teams are “groups of geographically, organizationally and/or time dispersed workers brought together by information and telecommunication technologies to accomplish one or more organizational tasks . . .”⁷ Such teams can be either ongoing or formed as needed to work together only on a specific deliverable. Virtual teams may hold face-to-face meetings at key stages in their work.⁸

Virtual Meeting: A virtual meeting is a meeting when participants do not come together face-to-face. Communication is usually via computer, but a telephone or video conference can also be called a virtual meeting.

Synchronous or Asynchronous Virtual Meeting: A telephone or video conference is synchronous, as members are participating at the same time. Meetings via the Internet can also be synchronous but are more commonly asynchronous with information being communicated via a password-protected website, often a wiki.

Computer-Mediated Communication (CMC): This refers to any use of the computer to support, structure, store, process, or distribute human communications or information. However, in addition to communication for decision support or virtual teams, CMC includes instant messaging; Web-based audio conferences or videoconferences; asynchronous, primarily text-based systems, such as e-mail or computer conferencing, etc.

Distributed Group Support Systems (DGSS): This is a system that combines communication, computer, and decision support tools and processes to support problem formulation and solution. Tools are provided for brainstorming, categorizing information, prioritizing ideas, and developing detailed plans. This is similar to a Group Decision Support System except that it is designed specifically for geographically distributed groups.

Part I: What Can Go Wrong?

It is widely believed that two heads are better than one for solving a difficult problem, and that three or four heads may be even better than two. This is based on the common assumption that the exchange of information and alternative viewpoints in a group will produce a better decision than any single member of the group acting alone. This assumption is true in theory, but in the real world we have to work hard to make it true in practice. Groups often fail to work that way. Humorist Dave Barry once observed,

⁷ Anne Powell, Gabriele Piccoli, & Blake Ives, “Virtual Teams: A Review of Current Literature and Directions for Future Research.” *The DATA BASE for Advances in Information Systems*, ” 35 (2004).

⁸ *Ibid.*

“If you had to identify, in one word, the reason that the human race has not achieved, and never will achieve, its full potential, that word would be *meetings*.”⁹

Part I of this report is devoted to some of the things that can go wrong in a task-oriented team or group process and also presents some preventive measures. Part II then presents actions a team or group can take to maximize its performance. Some problems are obvious to anyone who has participated in trying to arrive at decisions or judgments in a group meeting. Guidelines for how to run meetings effectively are widely available, but most group leaders fail to follow them.¹⁰ Key individuals are absent or late and participants are unprepared. Meetings are too often dominated by strong or senior personalities, while some group members fail to make the contribution they could. Discussion tends to get stuck on several salient aspects of a problem, rather than covering all aspects of the subject. Decisions may not be reached, and if they are reached, may wind up not being implemented.

Other problems that are less obvious but no less significant have been documented extensively by academic researchers. There are pressures toward consensus, so that if some reasonably satisfactory solution is proposed that all members can agree with, this ends the discussion without further search to see if there may be a better answer. Such a decision often falls short of the optimum that might be achieved. A phenomenon known as group “polarization” leads, under certain predictable circumstances, to a group decision that is more extreme than the average group member’s view prior to the discussion. In Part I we also discuss groupthink and the concept of social loafing.

Counterproductive Group Members

Groups are formed in a variety of ways. The person forming a group or calling a meeting often has little or no control over the selection of participants. For example, participants may be selected by the organization they represent or be determined by their area of expertise. It is not unusual to have participants who detract from, rather than contribute to, the group goals. Effective group leadership or an experienced facilitator is required to prevent, limit, or offset the adverse impact of such individuals on the group as a whole. Disruptive group members can be categorized as follows:¹¹

- Blocker: Blocks the progress of the group by initiating distracting or tangential discussions, rejects ideas without any consideration, and continually

⁹ Dave Barry, *Dave Barry Turns 50* (Ballantine Books, 1999).

¹⁰ J. Scott Armstrong, “How to Make Better Forecasts and Decisions: Avoid Face-to-Face Meetings,” *Foresight*, 5, (Fall 2006).

¹¹ Mainly from Phoenix Rising Coaching website, accessed August 14, 2007 at <http://www.phoenixrisingcoaching.com/documents/Article-TeamBuildingandTeamPerformance.pdf>.

Supplemented with information from Lynn Meade website on Small Group Communication, accessed August 10, 2007 at http://lynn_meade.tripod.com/id181.htm.

brings up old issues that the group has previously resolved.

- **Attacker:** Criticizes, blames, or accuses team members of negative motives; abuses those who disagree.
- **Attention-Seeker:** Seeks recognition through boasting, disruptive behavior, promoting extreme ideas, or other self-centered behaviors.
- **Withdrawer:** Acts passive and uncommitted to the group, fails to participate or to complete assigned tasks, misses meetings, passive-aggressively resorts to excessive formality when addressing other group members.
- **Monopolizer:** Seeks recognition and attention by monopolizing conversation, interrupts others before they have fully expressed their opinions, and competes with other group members for attention.
- **Poor Listener:** Often misunderstands what others are saying, sometimes due to thinking about what they want to say next rather than focusing on what the current speaker is saying.
- **Dominator:** Manipulates individual group members or the entire group by inappropriately exerting real or self-perceived authority.
- **Zealot:** Tries to convert members to a pet cause or idea, delivers sermons to group on state of the world, and exhibits fanaticism.
- **Cynic:** Displays sour outlook, engages in fault finding, focuses on negatives, and predicts failure of the group.

A form of disruptive behavior that occurs too often in computer-mediated communications is “flaming” – an insulting, demeaning, or sarcastic and often obscene personal criticism of another group member with whom one disagrees. This problem along with recommended preventive measures is discussed in Part II under Managing Conflict.

Hijacking the Meeting

Hijacking refers to one member taking control of a meeting in a manner that prevents the meeting from achieving its goals. One common form of hijacking is often unintended and may be particularly serious because it is not recognized as having adverse consequences. It is the senior or more knowledgeable or outspoken group member who speaks first and sets a direction and a framework that shapes the rest of the discussion. Academic research shows “that the order in which people speak has a profound effect on the course of a discussion. Earlier comments are more influential, and they tend to provide a framework within which the discussion occurs.... Once that framework is in

place, it's difficult for a dissenter to break it down,"¹² because discussion tends to center on that framework to the exclusion of other options that have not been mentioned.¹³

In other words, hijacking the discussion in this manner is a common precursor to the problems of premature consensus, groupthink, and polarization discussed below. If one respected group member lays out a direction in which the group should proceed, or perhaps the answer that he or she expects the group to come up with, others who are comfortable with that will speak up in support. A majority view is quickly formed, and anyone who might wish to explore an alternative may feel it is not worthwhile to speak up. For many people, being the minority voice is neither an easy nor a comfortable role. However, it is entirely possible that, if there were full discussion of all alternatives, the group might reach agreement on a different and better course. Academic researchers call this is called a "hidden profile" – a better solution that would be available to the group if input from multiple members were combined, but which is never identified because of the way the discussion is managed.

Two other forms of hijacking are readily recognized. One is the group member who talks so much that he or she monopolizes the discussion. Another is the group member who diverts the discussion to a different topic which may also be of interest but is not on the agenda for discussion at this meeting. Such hijackers deserve the scorn of their fellow group members. Other members become impatient and discouraged from making any input at all because the meeting has run on for so long.

Premature Consensus

Much research documents that the desire for consensus is an important cause of poor group decisions. This desire leads to premature closure, failure to examine the negative aspects of the preferred position, failure to identify or seriously consider alternatives, and failure to consider the consequences if one is wrong.¹⁴

There are many reasons why group members tend to go along with an emerging majority view, with a strong leader, or with the first group member to stake out a reasonable position. One is the common rule of thumb that when we have no firm opinion, we take our cues from the opinions of others. Another is that we follow others because we assume they know what they are doing, and we can learn from them without appearing uninformed.¹⁵ Also, many people with divergent views are reluctant to express

¹² James Surowiecki, *The Wisdom of Crowds* (New York: Doubleday, 2004), 186.

¹³ Stasser & Birchmeier, "Group Creativity and Collective Choice," 101.

¹⁴ Charlan J. Nemeth and Brendan Nemeth-Brown, "Better than Individuals? The Potential Benefits of Dissent and Diversity for Group Creativity," ed. Paul B. Paulus and Bernard A. Nijstad, *Group Creativity: Innovation through Collaboration* (New York: Oxford University Press, 2003), 63-64.

¹⁵ Robert B. Cialdini, *Influence: The Psychology of Persuasion* (New York: Quill Press, 1993)

them for fear that they will be criticized, or that any expression of dissent will be perceived as an act of disloyalty and an obstacle to the group reaching its goal.

Reluctance to express dissent is especially common at the senior levels. As one experienced consultant put it, "Admirals can really dampen interaction at a meeting." In the upper levels of management, people pay so much deference to the leader, and have so much to lose, that they often don't speak their minds.¹⁶ Leon Panetta, former California Congressman, head of the Office of Management and Budget, and Chief of Staff for President Clinton, recently wrote that "an unofficial rule in the bureaucracy says that to 'get along, go along.' In other words, even when it is obvious that mistakes are being made, there is a hesitancy to report the failings for fear of retribution or embarrassment. That is true at every level, including advisers to the president. The result is a 'don't make waves' mentality...that is just another fact of life you tolerate in a big bureaucracy."¹⁷

There are several ways to correct this problem. One is to ensure that the team or group includes members with diverse viewpoints, and that these members are actively encouraged to express any divergent views. The most knowledgeable and most senior members of the group should be encouraged to speak last, not first, so as not to intimidate other speakers. The recommended procedure for top management to obtain candid input from senior managers is to solicit anonymous input. "Even with people who work together all the time, anonymity changes the social protocols. People say things differently."¹⁸ Software is available that allows for anonymous group conversations and anonymous voting. Meeting participants enter comments onto laptops, and the comments are projected onto a screen without attribution. Some large organizations maintain a "decision room" for this type of computer-assisted meeting

A substantial number of studies using very different paradigms and settings, and conducted in different countries, show that minority viewpoints stimulate a more thorough consideration of an issue from multiple perspectives.¹⁹ This is manifested in the search for information, the strategies that are used, thoughts about the issue, detection of novel solutions, and creativity of the solutions.²⁰ Further, the research shows that these benefits from dissenting opinions seem to occur regardless of whether or not the dissenter is correct. The dissent stimulates a reappraisal of the situation and identification of options that otherwise would have gone undetected.²¹

¹⁶ Eric Matson, "The Seven Sins of Deadly Meetings," *Fast Company*, No. 2 (April 1996). Accessed at <http://www.fastcompany.com/online/02/meetings.html>.

¹⁷ Leon Panetta, "Government: A Plague of Incompetence," *The Monterey County Herald*, March 11, 2007, F1.

¹⁸ Matson, "The Seven Sins of Deadly Meetings."

¹⁹ Nemeth and Nemeth-Brown, "Better than Individuals?," 73

²⁰ Charlan J. Nemeth, "Dissent as Driving Cognition, Attitudes and Judgments," *Social Cognition*, 13 (1995): 273-291

²¹ Charlan J. Nemeth and Joel Wachtler, S., "Creative Problem Solving as a Result of Majority vs. Minority Influence," *European Journal of Social Psychology*, 13 (1996): 45-55.

Groupthink

One dictionary definition of groupthink is “conformity in thought and behavior among the members of a group, especially an unthinking acceptance of majority opinions.”²² The term is now broadly applied almost indiscriminately to any group decision that has not thoroughly considered alternative options and turns out to be wrong. For example, the Senate Select Committee on Intelligence’s *Report on the U.S. Intelligence Community’s Prewar Intelligence Assessments on Iraq*, in Conclusion 3, states that a “group think dynamic led Intelligence Community analysts, collectors and managers to both interpret ambiguous evidence as conclusively indicative of a WMD program as well as ignore or minimize evidence that Iraq did not have active and expanding weapons of mass destruction programs.”

This is very different from the phenomenon that Irving Janis studied and labeled groupthink 35 years ago. The term groupthink is now used so broadly to describe any wrong decision by a group that it has little value in diagnosing or describing the specific cause of a faulty decision. However, the phenomenon described by Janis is still observable today, so is useful for intelligence analysts to understand the original meaning of the term as well as the current popular meaning.

Janis coined the term after observing foreign policy decisions and outcomes during the administration of President John F. Kennedy. Within the period of a little over a year and a half, the Kennedy administration made one of the worst and one of the best foreign policy decisions in U.S. history. One was the ill-advised, failed émigré invasion of Cuba at the Bay of Pigs, the other the successful resolution of the crisis triggered by Soviet installation of missiles in Cuba. Janis wondered how the same group of people could produce such different decisions. A comparison of the group dynamics of both cases revealed the conditions of what he then called groupthink. He contrasted this with what he called “vigilant decision making” in which alternative options are openly discussed and critically evaluated.²³ He subsequently applied his groupthink theory to the analysis of other foreign policy successes and failures.

As defined by Janis, groupthink occurs when the group is dominated by a strong directive leader, considers only a few options, and voluntarily insulates itself from outside pressures. In other words, it usually applies to a relatively small leadership group. Janis identified the following eight symptoms of groupthink that he looked for when conducting his case studies to document the phenomenon.²⁴

1. Illusion of invulnerability shared by most or all group members: Creates excessive optimism that leads to ignoring dangers and taking risks.

²² Accessed May 20, 2007 at http://encarta.msn.com/dictionary/_/groupthink.html

²³ Janis, Irving L. *Victims of Groupthink* (Boston: Houghton Mifflin Company, 1972), 8.

²⁴ Janis, *Victims*, 197-204.

2. Collective rationalization: Members discredit and explain away warnings that might lead the group to reconsider its assumptions.
3. Unquestioned belief in the group's inherent morality: Members believe in the morality of their cause, and therefore feel free to ignore the ethical or moral consequences of their decisions.
4. Excessive stereotyping: Group constructs negative stereotypes of the enemy and of rivals who might be critical of the group's decision.
5. Direct pressure on dissenters: Any member who expresses strong arguments against any of the group's stereotypes, illusions, or commitments is informed that such dissent is contrary to what is expected of all loyal members.
6. Self-censorship: Doubts and deviations from the perceived group consensus are not expressed.
7. Illusion of unanimity: Silence is perceived as consent. Members perceive incorrectly that all members of the group are in agreement.
8. Self-appointed "mindguards": Members protect the group and the leader from information that might shatter their complacency about the correctness and morality of their decisions.

Janis found these symptoms in a number of cases including the U.S. failure to anticipate the attack on Pearl Harbor, the escalation of the Vietnam War, and the ill-fated hostage rescue in Iran.

Janis was correct in calling public attention to a form of dysfunctional decision making that had not previously been subject to systematic research. However, the theory Janis advanced to explain the cause of this phenomenon has not stood the test of time. He attributed groupthink to a policy-making group's need for consensus and cohesiveness to avoid the discomfort of decisional uncertainty. These group pressures lead to a deterioration of "mental efficiency, reality testing, and moral judgment," Janis believed.²⁵ Empirical support for this explanation is described by one leading specialist in group behavior as "mixed at best."²⁶ Other behavioral scientists have shown that poor decisions blamed on groupthink might also be caused by political considerations (politicthink), fear of rejection, or inefficacy of the group members.²⁷

Robert Jervis has commented as follows on the Senate Select Committee's finding that the Intelligence Community's faulty estimate on Iraqi WMDs was caused by groupthink:

"taken literally, this is simply incorrect. Groupthink is, as its name implies, a small group phenomenon..... Intelligence on Iraq was not developed by small groups, however. A great deal of work was done by individuals, and the groups were large and of a shifting composition.... In fairness to the SSCI, it is using the

²⁵ Janis, *Victims*.

²⁶ Paul G. Paulus, "Developing Consensus about Groupthink after All These Years." *Organizational Behavior and Human Decision Processes* 23, Nos. 2/3 (1998), 362-374.

²⁷ *Ibid.*

term groupthink in a colloquial rather than a technical sense. What is claimed to be at work are general pressures of conformity and mutual reinforcement.”²⁸

Jervis goes on to note that conformity and consensus in intelligence analysis is often warranted.

“The fact that several conscientious and intelligent people believe something is a valid reason for me to believe it. In many cases, everyone believes the same thing because there are good reasons to do so, which is one reason why cases of success are likely to be characterized by as high levels of agreement and mutual reinforcement as are cases of failure. What needs to be avoided is *unthinking conformity* in which everyone quickly accepts conventional wisdom, thereby reinforcing and perpetuating it without further examination.”²⁹

In the academic literature, there is now no consensus on exactly what constitutes groupthink.³⁰ For our purposes, any premature consensus that is marked by a desire for conformity and failure to seriously consider proposed alternatives might appropriately be called groupthink. There is a simple but effective preventive measure to help analysts avoid this or any other form of groupthink: always seek out alternative perspectives or opinions, and then try to understand them and the unstated assumptions behind them.

Polarization

Polarization is the phenomenon that occurs when discussion within a group leads the group to take an extreme position. The group makes a decision that is more extreme than the most extreme member’s view prior to the discussion. Intuitively we would expect group discussion to moderate the most extreme positions, but “evidence from jury decisions and three decades of experimental research suggests that, much of the time, the opposite is true.”³¹ For example, studies of mock juries deliberating on punitive damage awards to plaintiffs often award damages that are either higher or lower than the amount any individual juror had favored prior to the deliberation. When jurors initially favored a relatively low award, discussion would lead to an even lower one. When they initially favored a relatively high award, discussion would make it even higher.³²

²⁸ Robert Jervis, “Reports, Politics, and Intelligence Failures: The Case of Iraq,” *Journal of Strategic Studies*, 29 (2006), 3-52.

²⁹ *Ibid.*

³⁰ Marlene E. Turner & Anthony R. Pratkanis, “Twenty-five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory,” *Organizational Behavior and Decision Processes*, 73 (1998).

³¹ James Surowiecki, *Wisdom of Crowds* (New York: Doubleday, 2004), 184.

³² R. M. Bray & A. M. Noble, “Authoritarianism and Decisions of Mock Juries: Evidence of Jury Bias and Group Polarization,” *Journal of Personality and Social Psychology*, 38 (1978), 1424-1430. R. J. MacCoun & N. L. Kerr, “Asymmetric Influence in Mock Jury Deliberation: Jurors’ Bias for Leniency,” *Journal of Personality and Social Psychology* 54 (1988), 21-33.

Such polarization of group deliberations has been found in hundreds of studies in multiple fields in more than a dozen countries.³³ After many years of research, sociologists have determined why and under what circumstances this occurs.

Persuasive Argument: People often come to a meeting without strong convictions on the topic under discussion. They are influenced by the arguments made by other members of the group, especially arguments they agree with. When people hear arguments that they perceive as valid, or find to be memorable, vivid, new, or weighty simply by virtue of emphasis and repetition, they will shift in the direction suggested by those arguments. When the initial arguments presented to the group, or a majority of the arguments, are predisposed in one direction, the position of the group as a whole tends to move in that direction. If a majority of the group is already leaning in one direction, all members of the group will hear more such arguments supporting that direction than arguments supporting any other direction.³⁴

This type of intensification of beliefs also occurs in everyday life. Because we typically associate with people similar to ourselves, our interactions tend to strengthen the opinions we already hold. When we talk with someone who shares our views, we often hear additional arguments in support of what we already think. This reinforces and makes us more confident in our beliefs. There is evidence that the rise of terrorist organizations is partly explained by group polarization. That is, like-minded anti-government individuals conversing together, and without other moderating voices, will often move toward more extreme positions.³⁵

Social Comparison: People want to be perceived favorably by other group members, and also to perceive themselves in a favorable light. Once they hear what others believe, they adjust their positions in a direction with which they are more comfortable. For example, people may not want to have to defend a minority position, not want to appear too aggressive or too cautious, too enthusiastic or too restrained. They don't want to appear uninformed, and they may not want to be responsible for prolonging a meeting, so they will frame their position in a manner with which they are comfortable. Before they hear what others think, many people assume that others share their own position. After they hear what others think, they often find that they occupy a somewhat different position, and they shift accordingly. The point here is, that just learning the actual position of other group members, without even hearing a discussion of their views, will prompt some group members to modify their position.³⁶

³³ Cass R. Sunstein, "Deliberating Groups versus Prediction Markets" The Law School, University of Chicago, Working Paper No. 321 (January 2007).

³⁴ Sunstein, "Deliberating Groups."

³⁵ C. McCauley & M. Segal, "Social Psychology of Terrorist Groups," ed. C. Hendrick, *Review of Personality and Social Psychology: Group Process and Intergroup Relations* (Beverly Hills, CA: Sage, 1987), 231-56.

³⁶ Paraphrase of Cass S. Sunstein, "The Law of Group Polarization," The Law School, University of Chicago, Working Paper No. 91 (December 1999).

Increased Confidence: If what people hear supports their own beliefs, they gain increased confidence in those beliefs, and people who become more confident tend to become more extreme. “In a wide variety of experimental contexts, people’s opinions have been shown to become more extreme simply because their views have been corroborated, and because they have become more confident after learning of the shared views of others.”³⁷

Research has also identified a number of conditions under which polarization is most likely to occur.³⁸

- When views are not firmly held, but the majority has an initial predisposition in one direction, polarization is likely.
- In an uncertain environment when judgment is influenced by assumptions, values, or emotions, polarization is likely. It is likely to be especially large when discussing political or moral issues.
- If members perceive themselves as a cohesive group with a common identity, polarization is more likely than if they perceive themselves as individuals brought together only for a specific task.

Group polarization can often cause a wrong judgment or decision. This happens when the group members’ initial predisposition is wrong, and the polarization results in little time devoted to the identification and examination of other better alternatives. Even if the group’s initial predisposition is basically correct, polarization may lead to a more extreme judgment or greater confidence in a decision than is warranted. For example, the significance of a problem may be exaggerated, or the probability of a future event happening may be over- or understated. If group members are vulnerable to any type of bias, including cognitive or hindsight biases, or analytical pitfalls such as premature closure, polarization may reinforce such mistakes.

In order to prevent group polarization, the most important lesson is “to structure processes of deliberation so as to ensure that people are exposed, not to softer or louder echoes of their own voices, but to a range of reasonable alternatives... What is necessary is not to allow every view to be heard, but to ensure that no single view is so widely heard, and reinforced, that people are unable to engage in critical evaluation of the reasonable competitors.”³⁹

Social Loafing

³⁷ Sunstein, “Deliberating Groups,” p. 19, citing Roger Brown, *Social Psychology* (New York: Free Press, 1986), 200-240.

³⁸ Sunstein, “Group Polarization,” 15-17.

³⁹ Sunstein, “Group Polarization,” 28.

Social loafing is the phenomenon that people working in a group will often expend less effort than if they were working to accomplish the same task on their own. This was first identified 80 years ago when it was observed that as additional people are added to a group pulling on a rope, the total force exerted by the group increased, but the average force exerted by each group member declined. This has subsequently been identified repeatedly by a number of psychologists conducting experiments with a variety of group tasks, and it is now generally accepted as a widespread phenomenon.⁴⁰ To the extent that social loafing occurs, individuals perform below their potential when working in a group.

There are several reasons why individual group members may participate in social loafing.⁴¹

- When success is measured by group performance, individual group members may feel that the pooled efforts of others will make up for their lack of effort, or that their effort is not needed to achieve the group goal.
- Some group members whose motivation is focused on self-interest may feel that they have little to gain by devoting time to the collective effort.
- Some group members may feel that their contribution is redundant, or that the quality of their ideas is so low that it does not warrant attention of the entire group.
- Other group members may be introverted and be hesitant to participate in group discussions.

The consequence of social loafing is often to diminish the quality and value of the group product. Social loafing is least likely to occur when:

- The group task is perceived as particularly important.
- The group is so small that any one member's lack of input will be readily evident.
- Each member is assigned a specific task.
- Each member's contribution to the group effort will be recognizable in the final product.

⁴⁰ Accessed May 19, 2007, at

http://en.wikibooks.org/wiki/Managing_Groups_and_Teams/Social_Loafing.

⁴¹ Michael W. Eysenck, *Psychology: An International Perspective* (New York: Psychology Press, 2004), 737-740.

Problems in Computer-Mediated Communication

Misunderstanding and interpersonal conflict are far more common in computer-mediated communication than in face-to-face meetings, as a wide range of signals we take for granted are missing. “We can’t see puzzled faces, hand gestures, body language, ebbs and flows of physical energy and involvement.”⁴² When dependent upon the written word, it is often unclear whether team members are understanding, agreeing, disagreeing, getting uncomfortable, or very pleased. Those reactions commonly are expressed through body language and tone of voice that are missed during online communications. When online, they need to be communicated explicitly in text.

The absence of informal, spontaneous communication opportunities also has a significant impact on how groups function. That is, people who work in the same building often “run into one another at the water cooler, coffee machine, and copier. They see one another come and go to meetings. They meet in the lunch room. These casual encounters increase the convenience and pleasure of communication, and they allow for unplanned and multipurpose interactions. Ongoing work progresses more seamlessly when people communicate often and spontaneously. With spontaneous casual communication, people can learn, informally, how one another’s work is going, anticipate each other’s strengths and failings, monitor group progress, coordinate their actions, do favors for one another, and come to the rescue at the last minute when things go wrong.”⁴³ This is lacking in virtual teams or groups.

These limitations are present in any geographically distributed group, but measures can be taken to mitigate their impact. These mitigating measures are discussed in Part II.

Part II: How to Get It Right

In the Intelligence Community, small groups of analysts are often formed on an ad hoc basis to work on a specific analytic issue. Who is included in the group is often dictated by relevant expertise. Often, no single member of the group is formally designated as the leader. A professional facilitator or moderator is seldom available. When group members all work within the same organizational unit, they may not have the diversity of views needed to avoid a premature consensus by effectively considering all alternatives. On the other hand, if group members come from different offices or agencies, it may be difficult to avoid some element of interoffice competition or a history of interagency disagreement.

⁴² Michael J. McQuaid *et al*, “Tools for Distributed Facilitation,” Proceedings of the 33rd Hawaii International Conference on Systems Sciences, 2000. Accessed October 12, 2007 at <http://csdl2.computer.org/comp/proceedings/hicss/2000/0493/01/04931041.pdf>

⁴³ Sara Kielser & Jonathon N. Cummings. “What Do We Know about Proximity and Distance in Work Groups: A Legacy of Research,” in P. Hinds and S. Kiesler, eds. Distributed Work. Cambridge, MA: MIT Press, 2002.

This means that analysts in Intelligence Community agencies are by no means immune to the kinds of problems discussed in Part I. Improving group performance will require an understanding of these problems, conscientious effort to avoid them, and a broad program of training in group facilitation and what it means to be a good team member.

Is this Meeting Necessary?

There is a feeling in many organizations that meetings are not nearly as effective as they should be. They take too long and often fail to achieve their goals. How to conduct an effective meeting is not within the scope of this report. Ample guidance on that topic is available with a simple Google search on “effective meetings.”

It is appropriate to consider, however, whether all these meetings are really necessary – especially under circumstances when travel time needs to be added to meeting time. For some people, the sheer number of meetings they must attend is formidable. Within the Washington metropolitan area, Intelligence Community offices are becoming more widely dispersed and travel times are getting longer. Nationally, airplane travel has become less desirable.

Under some common circumstances, a virtual meeting is more effective than a face-to-face meeting even when all participants are located in the same building. If there are more than four or five participants, and the goal is to obtain ideas or information, or to critique or evaluate a specific idea, simply calling a meeting may not be the best way to proceed. Some tasks are best accomplished through a combination of virtual and face-to-face communication. Initial ideas and opinions can be solicited and discussed by e-mail, in a blog, or on a wiki. Some analysts are more likely to communicate their views in writing than to speak out at a meeting, and everyone usually makes a better contribution when given the time to carefully formulate their ideas. In other words, it is sometimes appropriate “to ask the person who calls a meeting to describe the problem and to inquire whether it would be useful to ask participants to provide suggestions by email rather than to attend the meeting.”⁴⁴ After all the input has been received and distributed back to the group members, a face-to-face meeting may then be appropriate for discussion and convergence on an optimal solution or course of action.

Group Size and Composition

Group or team size and composition affect group processes and outcomes. A Google search for information on optimal team size turns up answers that range between 3 to 7 and 5 to 12, or “no larger than 2 pizzas can feed.”⁴⁵ The larger the group, the greater the pool of talent and experience that is available for solving problems. However,

⁴⁴ Armstrong, “How to Make Better Forecasts.”

⁴⁵ A “2-pizza team” is a unique term used at Amazon for an autonomous, cross-functional team that delivers an end-to-end solution from software development to customer relations.

as size increases, fewer members actively participate and one or two members begin to dominate, or the group divides into subgroups. Also, as size increases, the ability to keep all members fully informed on all aspects of the work project diminishes. On the other hand, if the team is too small, it may lack the resources and diversity of backgrounds required for optimal performance.

The nature of group and team leadership varies considerably. If the group members and their leader are appointed by management, the result may be a standard top-down leadership style. More commonly these days, teams are formed on their own initiative to meet needs for a specific project. Such teams may be self-directed or may have one member who serves as a facilitator rather than a manager. There are leadership functions that need to be performed, however, and these may be shared within the team.

To the extent possible, group and team members should represent diverse types and levels of experience or education, functional specialties, ages, and genders. All things being equal, heterogeneous groups will be able to draw on a wider base of knowledge, experience and thinking styles when formulating and coping with intelligence problems. As noted below, diversity of opinion is the single best guarantee that the group will reap benefits from a meeting.

Encourage Diverse Ideas, Opinions, and Perspectives

The literature on small group performance is virtually unanimous in emphasizing that groups make better decisions when their members bring to the table a diverse set of ideas, opinions, and perspectives. The underlying cause of premature consensus, groupthink, and polarization, as previously discussed, is a failure to adequately identify and consider alternative points of view. Laboratory experiments have shown that even a single dissenting opinion, all by itself, makes a group's decisions more nuanced and its decision-making process more rigorous.⁴⁶ It was noted previously that "the research also shows that these benefits from dissenting opinions occur regardless of whether or not the dissenter is correct. The dissent stimulates a reappraisal of the situation and identification of options that otherwise would have gone undetected."⁴⁷ The same research shows that in order to be effective, the dissent must be genuine and not generated artificially as in some applications of the devil's advocacy technique.⁴⁸

Briefly, this means the route to better analysis is small groups of analysts who speak up and express a wider range of ideas, opinions, and perspectives. This can be achieved by the formation of more heterogeneous groups and the increased use of structured analytic techniques. Interestingly, this is the direction in which the Intelligence Community is now moving.

⁴⁶ Surowiecki, *Wisdom*, 183-184.

⁴⁷ Nemeth & Nemeth-Brown, "Better than Individuals?" 73.

⁴⁸ Nemeth & Nemeth-Brown, "Better than Individuals?" 76-78.

- Individual analytic units tend to develop a common perspective on events. A heterogeneous group that includes analysts from other offices or agencies will bring out a wider range of views leading to more rigorous analysis.
- By breaking a problem down into its component parts, structured analytic techniques provide structure to the interaction of analysts within a team or group as well as to individual thought processes. Individual analyst's thoughts are externalized in a list, map, matrix, model, or other structured form where they can be reviewed or compared and critiqued by other group members. This ensures that differences between analysts are identified and discussed early in the process. It is, in effect, a systematic process for eliciting divergent information. Such a group process helps to reduce the risk of premature consensus, groupthink, and polarization. This is discussed further in Part III.

Diversity of opinion is, of course, a double-edged sword, as it can easily be a source of conflict which degrades group effectiveness.⁴⁹ Social psychologists distinguish between cognitive conflict over ideas, which is healthy, and emotional conflict that is divisive and counterproductive. Conflict management is discussed in a subsequent section.

Consultants in group or team performance recommend a variety of tactics for ensuring that all potentially useful information is brought out during group deliberations. These include:⁵⁰

- The leader should take an active role in ensuring that everyone has a chance to speak. One possibility is to pass out 3x5 cards to everyone around the table and ask them to write down their key ideas in silence. After collecting the cards, the leader can then read them out to the group in serial fashion or use the information on the cards to guide the discussion and ensure that divergent ideas get a hearing.
- The leader should assign the role of critical evaluator to each member; encouraging the group to give high priority to open airing of objections and doubts.
- Senior officials assigning a potentially controversial task to a group should take an impartial position, avoiding any statement of preference or expectation

⁴⁹ Frances J. Milliken, Caroline A. Bartel, & Terri R. Kurtzberg, "Diversity and Creativity in Work Groups: A Dynamic Perspective on the Affective and Cognitive Processes that Link Diversity and Performance," ed. Paul B. Paulus & Bernard A. Nijstad, *Group Creativity: Innovation through Collaboration* (New York: Oxford University Press, 2003), 33.

⁵⁰ Most of these points come from the Spectrum IT Consulting, LLC, website at www.SpectrumWebsite.com, accessed August 21, 2007.

about what the outcome should be.

- The most influential members of a group should not be the first to state their position, as this may lead to premature formation of a majority that discourages others from expressing a different opinion.
- When members come from different offices, ask each member to discuss the group's deliberations with knowledgeable associates in his or her own unit of the organization, and to report back their reactions.
- Invite one or more outside experts to each meeting, on a staggered basis, and encourage the experts to challenge the group's thinking.
- After making an initial decision, hold a "second-chance" meeting. The break provides time for each member to express any residual doubts and rethink the entire issue before making a final choice.
- Instead of providing a single recommendation, rank-order a set of three or more alternatives. The need to rank-order the second and third choices forces deeper analysis of these alternatives than would otherwise be done, which sometimes results in the second or third choice moving up to the first choice.

Follow a Sound Analytic Process

Teams are more likely to make a good judgment or decision when they follow a sound analytical process.

- **Consider Multiple Alternatives:** When groups consider multiple alternatives, they engage in more thoughtful analysis and avoid the temptation of satisficing – settling too quickly on an easy or obvious answer that seems to meet the need.
- **Test Assumptions:** There are two types of "facts": those that have been carefully tested and those that have been only asserted or assumed. Assumptions are necessary when hard evidence is lacking, but they should be identified, examined, and confirmed to the extent possible. The Key Assumptions Check is a useful tool for this purpose.
- **Dissent and Debate:** The quality of debate is measured by the kinds of questions being asked and the level of listening. If participants routinely interrupt one another or pile on rebuttals before digesting the preceding comment, the team is engaged in emotional conflict rather than constructive debate.

Cross-fertilization of ideas is important and necessary. Ideas should be combined with each other to form further and even better ideas. If creative thinking involves

forging new links between previously unrelated or weakly related concepts, then creativity will be stimulated by any activity that brings more concepts into juxtaposition with each other in fresh ways. Interaction with other analysts is one basic mechanism for this. As a general rule, people generate more creative ideas when teamed up with others; they help to build and develop each other's ideas. Personal interaction can also induce greater effort and help maintain concentration on the task.

Making Virtual Communications Work

Although Intelligence Community headquarters offices are located in the Washington metropolitan area, they are sufficiently dispersed that attendance at interagency meetings can become burdensome. This makes virtual meetings attractive, and the availability of Intellipedia and plans for a new A-Space network will make computer-mediated, interagency meetings technically possible.⁵¹ On the other hand, the offices are close enough that face-to-face meetings can be held whenever truly needed. In other words, analysts in the general Washington, DC, area can often gain some of the benefit of computer-mediated communications while mitigating the down side of virtual work through formal or informal personal meetings as necessary. Analysts are able to choose whichever means of communication is likely to be most cost effective for any specific task.

Considerable research on virtual teaming shows that leadership effectiveness is a principal factor in the success or failure of a virtual team.⁵² When face-to-face contact is limited, leaders must make up for this by paying more attention than they might otherwise devote to:

- Articulating a clear mission, goals, tasks, procedures for evaluating results.
- Defining measurable objectives with milestones and time lines for achieving them.
- Identifying clear and complementary roles and responsibilities. Building relationships with and between team members and with stakeholders.
- Agreeing on team norms and expected behaviors.
- Defining conflict resolution procedures.

⁵¹ A-Space is a new "common workspace accessible to all analysts throughout the Intelligence Community, providing tools and services to enhance information sharing and collaboration." This description is from Office of the Director of National Intelligence, "A-Space: The Intelligence Community Collaboration Workspace," distributed at ODNI Conference, January 2007.

⁵² Jonathan N. Cummings, "Leading Groups from a Distance: How to Mitigate Consequences of Geographic Dispersion," ed. Susan Weisband, *Leading Groups from a Distance: Consequences of Geographic Dispersion* (Oxford, UK: Routledge, 2007).

- Developing specific communication protocols and practices.⁵³

“Early face-to-face meetings during a team’s launch phase have been found to improve the team’s project definition, to foster socialization, trust, and respect among team members, and to enhance the effectiveness of subsequent electronic communication.”⁵⁴ The initial team meeting should be in person if at all possible. In addition to discussing the team’s mission or charter and learning whatever technology is to be used, there is need for a get-acquainted session that identifies each team member’s expertise and any special function that any individual might have on the team. This helps pave the way for future computer-mediated communication.

Trust in one’s team members is also correlated with successful teamwork. People tend to trust others who “perform competently, act with integrity, and display concern for the well-being of others.” Examples of behaviors that undermine trust include failure to follow through on what one promised to do, trying to manipulate the outcome of the team deliberation, and taking personal credit for the team’s achievement.⁵⁵

Guidance on how to manage online meetings and virtual teams is readily available on the Internet. Materials the author found useful include the following:

“Collaborative Facilitation” available at
<http://www.groupmindexpress.com/lib/Collaborative%20Facilitation.pdf>

“Managing Virtual Teams” available at
<http://www.groupjazz.com/pdf/vteams-toronto.pdf>

“Maximizing Team Learning through Boundaryless Facilitation” available at
http://www.catalystonline.com/about_us/pdfs/cct_maximizing_team_learning.pdf

Inquiry vs. Advocacy

In a task-oriented team environment, advocacy of a specific position must be avoided, as it can lead to emotional conflict and reduced team effectiveness. Advocates tend to examine evidence in a biased manner, accepting at face value information which seems to confirm their own point of view and subjecting any contrary evidence to highly critical evaluation. Advocacy is appropriate in a meeting of stakeholders that one attends for the purpose of representing a specific interest. It “is an effective method for making decisions in a courtroom when both sides are effectively represented, or in an election

⁵³ Sage Freechild, “Team Building and Team Performance Management.” Accessed September 15, 2007 at <http://www.phoenixrisingcoaching.com/documents/Article-TeamBuildingandTeamPerformance.pdf>

⁵⁴ Powell, Piccoli, & Ives, *Virtual Teams*, 8.

⁵⁵ Deborah L. Duarte & Nancy Tennant Snyder, *Mastering Virtual Teams* (San Francisco, CA: Jossey-Bass, 2006), 145-150.

when the decision is made by a vote of the people.”⁵⁶ However, it is not an appropriate method of discourse within a team “when power is unequally distributed among the participants, when information is unequally distributed, and when there are no clear rules of engagement – especially about how the final decision will be made.”⁵⁷ An effective resolution may be found only through the creative synergy of alternative perspectives.

The following table displays the differences between advocacy and the objective inquiry expected from a team member.⁵⁸

	Advocacy	Inquiry
Concept of decision making	A contest	Collaborative problem solving
Purpose of discussion	Persuasion and lobbying	Testing and evaluation
Participants’ role	Spokespeople	Critical thinkers
Pattern of behavior	Strive to persuade others Defend your position Downplay weaknesses	Present balanced arguments Remain open to alternatives Accept constructive criticism
Minority views	Discouraged or dismissed	Cultivated and valued
Outcome	Winners and losers	Collective ownership

When advocacy leads to emotional conflict, it lowers team effectiveness by provoking hostility, distrust, cynicism, and apathy among team members. On the other hand, objective inquiry, which often leads to cognitive conflict, can lead to new and creative solutions to problems, especially when it occurs in an atmosphere of civility, collaboration, and common purpose.

Managing Conflict

As emphasized throughout this report, diversity of ideas and opinions generally contributes to more effective analysis; however, it may also contribute to conflict within the group or team. It is necessary to distinguish constructive conflict between ideas, which often leads to innovative solutions and emotional conflict between individuals. Conflict which stems from interpersonal animosity or long-standing conflict, or from competition between organizational units, usually degrades the quality of analysis.

⁵⁶ Martha Lagace, “Four Questions for David Garvin and Michael Roberto,” *Working Knowledge for Business Leaders* (Harvard Business School Weekly Newsletter, October 15, 2001). Accessed June 13, 2007 from <http://hbswk.hbs.edu/item/3568.html>.

⁵⁷ *Ibid.*

⁵⁸ David A. Garvin and Michael A. Roberto, 2001. “What You Don’t Know about Making Decisions,” *Harvard Business Review*, 79 (2001):108-116. Accessed June 12, 2007 at <http://hbswk.hbs.edu/item/2544.html>

It is not easy to emphasize true collaboration and teamwork into a community with a history of interagency rivalry and mistrust. Managing conflict is the responsibility of the group or team leader, although all members may need to assume some of the responsibility, especially in informal, self-directed teams which have no formal leader. It is important that any emotional conflict is addressed early, not avoided. If not resolved, it often simmers until suddenly reaching a boil.

As the Intelligence Community places increased emphasis on interagency collaboration, the need for experienced facilitators and interagency training in conflict resolution becomes increasingly urgent. Facilitators can simultaneously guide the group in the use of structured analytic techniques while encouraging more effective small group behavior. Community-wide training in the knowledge, skills, and abilities required for optimal management of group processes in general is discussed in the next section. Conflict management should be one part of that training.

There is, of course, a large literature on conflict resolution, with a number of different methods that might be taught to intelligence analysts.⁵⁹ Reviewing this literature is beyond the scope of this report, but research for this report did surface several ideas that warrant presentation here.

One set of rules for *avoiding* conflict is often recommended by consultants on small group processes. The idea is to be proactive in laying out the ground rules when a new group or team is first formed. Having the rules in place will help prevent problems from occurring and make the rules easier to enforce if a problem does arise. Team members are asked to abide by the following written “Rules for Constructive Controversy.”⁶⁰

1. I am critical of ideas, not people. I confirm others' competence while disagreeing with their positions.
2. I remember that we are all in this together. I focus on coming to the best decision possible, not on “winning” the argument.
3. I encourage everyone to participate and to master all the relevant information.
4. I listen and try to understand everyone's ideas, even if I don't agree.
5. I restate what someone has said if it is not clear to me.
6. I first try to bring out all the ideas and facts. Only then do I try to put them together in a way that makes sense.
7. I change my mind when the evidence clearly indicates that I should do so.

⁵⁹ For a brief discussion of three methods, see http://www.geocities.com/lazaridou/resolving_conflict_in_work_teams.htm

⁶⁰ David W. Johnson and Roger T. Johnson, *Constructive Controversy: Intellectual Disagreement in the Classroom*, 4th Edition (Edina, MN: Interaction Book Company, 2007). Several of the rules have been slightly edited to make them more appropriate for a government environment.

Particularly firm rules are needed against personal criticism in online communications. Some people are less inhibited online and tend to say things online that they would never say in person. This often includes insulting, demeaning, or sarcastic and often obscene personal criticism of another analyst or manager with whom one disagrees. CIA analysts and managers have observed that some of the “cruel and snide comments become a virtual drive-by-shooting.”⁶¹ This is commonplace in Internet discussion groups, but it is out of order and should be prohibited even in informal communications when using a U.S. Government computer system. Such “flaming,” as it is often called, is unprofessional, counterproductive, and an impediment to interoffice and interagency collaboration.

A widely distributed article in the *Harvard Business Review* argues that improved collaboration between organizations or organizational units that have different interests can only be achieved by accepting and actively managing the inevitable – and desirable – conflicts between these units.⁶² According to the authors, Jeff Weiss and Jonathan Hughes,

“The disagreements sparked by differences in perspective, competencies, access to information, and strategic focus within a company actually generate much of the value that can come from collaboration across organizational boundaries. Clashes between parties are the crucibles in which creative solutions are developed and wise trade-offs among competing objectives are made. So instead of trying simply to reduce disagreements, senior executives need to embrace conflict and, just as important, institutionalize mechanisms for managing it.”

Weiss and Hughes recommend strategies for managing disagreements at both the point of conflict and at the time conflicts are escalated to a higher level. At the point of conflict, they recommend each organization have its own standardized, step-by-step procedure for conflict resolution. For a team of intelligence analysts, resolution of conflicting opinions might involve one or more of the structured analytic techniques such as Key Assumptions Check or Analysis of Competing Hypotheses that help to identify the root source of the differences. The goal is to obtain a deeper understanding of the issue rather than debate who is right or wrong.

Weiss and Hughes’ most valuable contribution is their recommended strategy for the escalation of conflict. What typically happens is that a frustrated analyst takes the problem up to his or her boss, briefly explaining the conflict in a manner that is clearly supportive of the analyst’s own position. The analyst then returns to the group armed with his or her boss’ support. However, the opposing analyst(s) have also gone to their bosses and come back with support for their solution. Each analyst is then locked into what has become “my manager’s view” of the issue. An already thorny problem has become even more intractable.

⁶¹ Personal communication to the author from a recently retired senior analyst.

⁶² Jeff Weiss & Jonathan Hughes, “Want Collaboration? Accept – and Actively Manage – Conflict,” *Harvard Business Review*, March 2005.

The recommended solution is to establish and enforce a requirement for joint escalation. The analysts should be required to prepare a *joint* statement describing the disagreement and present it jointly to their boss or bosses. This ensures that managers have access to multiple perspectives on the conflict, its causes, and the various ways it might be resolved.

Just the need to prepare such a joint statement discourages escalation and often leads to an agreement. Weiss and Hughes report their experience that “companies that require people to share responsibility for the escalation of a conflict often see a decrease in the number of problems that are pushed up the management chain. Joint escalation helps create the kind of accountability that is lacking when people know they can provide their side of an issue to their own manager and blame others when things don’t work out.”

Training

As the Intelligence Community places increased emphasis on interagency collaboration and more work is done through computer-mediated communications, it becomes increasingly important that analysts be trained in the knowledge, skills, and abilities required for facilitation and management of face-to-face as well as virtual team or group meetings, including a strong emphasis on the management of conflict during such meetings. Training is most effective when it is available just before the skills and knowledge must be put to use.

An Intelligence Community-wide training program of this sort could provide maximum support to interagency collaboration and the formation of virtual teams. Whenever a new interagency or virtual team or work group is formed, it would be appropriate to ensure that all members have the same training in the pitfalls of group processes, performance expectations, standards of conduct, and conflict resolution procedures. Standardization of this training across the Intelligence Community would accelerate the development of a shared experience and culture and reduce start-up time for any new interagency group.

Communities of Practice

A “community of practice” (CoP) is “a group of people who share a specific concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”⁶³ It is a relatively new organizational form that, according to the *Harvard Business Review*, “promises to complement existing structures and radically galvanize knowledge sharing, learning, and change.”⁶⁴ The terms community of practice and community of interest are both so broadly defined and flexible that there is some overlap. Both involve the sharing of

⁶³ Etienne C. Wenger, R. McDermott, & William M. Snyder, *Cultivating Communities of Practice* (Boston: Harvard Business School Press, 2002).

⁶⁴ Etienne C. Wenger & William M. Snyder, “Communities of Practice: The Organizational Frontier,” *Harvard Business Review* (January-February 2000).

information about some domain of common interest. However, a CoP is open only to registered members, places greater emphasis on learning from one's peers as in an apprentice system, and may be associated with a knowledge management system.

CoP members share information with others performing similar tasks in order to learn from each other, help each other, mentor new or less experienced members, and often promote changes in work processes or the work environment that enable members to perform more effectively. Participation is voluntary and relationships are collegial not hierarchical. CoPs take a wide variety of forms. They differ in whether they are self-generated or sponsored by management, how members are selected, whether membership is within one organization or across many organizations, and degree of dependence on information and communications technology. CoPs were originally conceptualized as a phenomenon emerging spontaneously in organizations, but they have proven so useful that organizations are now taking the initiative to sponsor and nurture many of these communities as an important element of the organization's knowledge management system.⁶⁵

There are various ways that CoPs might be applied in the analytic community. There might be interagency CoPs for analysts working on specific countries or subject areas, for users of a specific analytic technique, or a CoP that becomes part of a knowledge management system for structured analytic techniques in general.⁶⁶ CoPs could be self-initiated by various groups of analysts, or they might be part of a broader agency initiative as is the case in the Department of Defense (DoD).

DoD has several years of experience with CoPs. Particularly noteworthy are the 15 different CoPs plus 24 Special Interest Areas sponsored by the Defense Acquisition University (DAU). There may be lessons learned that would apply to adapting this concept to the Intelligence Community. For information on the DAU program, go to <http://acc.dau.mil>, select Knowledge Sharing, and then link to Acquisition Community Connection.

For a fuller explanation of CoPs by a prominent specialist in this field, see "Communities of Practice: A Brief Introduction" at <http://www.ewenger.com/theory/>. For a discussion of why CoPs are needed and how they work, see "Communities 2.0: Addressing Workforce Trends through New Learning Models" at <http://www.tomoye.com/TomoyeWhitePaperOnCommunities2.0.pdf>. For an IBM cost-benefit analysis of CoPs, see "Communities of Practice and Organizational Performance" at <http://www.research.ibm.com/journal/sj/404/lesser.html>.

⁶⁵ Line Dube, Anne Bourhis, & Real Jacob, "Towards a Typology of Virtual Communities of Practice." *Interdisciplinary Journal of Information, Knowledge, and Management* 1 (2006).

⁶⁶ This author is proposing a knowledge management system for structured analytic techniques in a separate report for ODNI/ARDA, in process, entitled "Proposed Taxonomy and Knowledge Management System for Structured Analytic Techniques."

Part III: Structured Analytic Techniques and Group Processes

This part starts with a discussion of the relationship between structured analytic techniques and group processes in general. This is followed by a discussion of structured techniques that are especially appropriate for use by virtual teams or groups. It then discusses three general categories of structured analytic techniques that are specifically intended to be used by groups rather than individual analysts. These are techniques for reframing the question, generating ideas, and aggregating expert opinion.

Group Use of Structured Techniques

Just as structured analytic techniques provide structure to our individual thought processes, they also provide structure to the interaction of analysts within a small team or group. Some techniques stimulate the generation of new ideas while others require analysts to break a problem down into its component parts and consider each part separately. When a structured analytic technique is used by a small group, each step in the technique prompts discussion among the group. Such discussion generates and evaluates substantially more divergent information and new information than a group which does not use such a structured process.

For example, the process of creating an Analysis of Competing Hypotheses (ACH) matrix requires identification of the evidence and arguments being used and how these are interpreted as either consistent or inconsistent with each of the hypotheses. Review of this matrix provides a systematic basis for identification and discussion of differences between any two or more analysts. ACH exercises with more than 3,000 students in multiple agencies show that students disagree with their partners on how to rate the evidence in about 25% to 35% of the cells of the matrix. The differences are usually traced to two students interpreting the data differently, bringing different experiences to the table, or simply not considering a key fact that their colleague points out to them. The differences usually are resolved with the initial view being accepted about half the time and the contrary view the other half.⁶⁷ When consensus fails to materialize, the ACH software allows for analysts to mark areas of disagreement with a “flag,” and then both majority and minority views can be documented in the “evidence notes” portion of the matrix.

The above discussion illustrates how structured techniques elicit significantly more divergent information when used as a group process. Based on the research findings discussed in Part II about the value of divergent information, one may conclude that the use of any structured technique improves the quality of analysis as compared with analysis by a single individual or by a group that does not use a structured process. The experience of CIA analysts using the Analysis of Competing Hypotheses (ACH) software in their work supports this conclusion. Their preferred use of this tool is to gain a better understanding of the differences of opinion with other analysts or between analytic

⁶⁷ Personal communication to the author from Randy Pherson.

offices. They consider this discussion the most valuable part of the ACH process. They also find that reference to the matrix helps depersonalize the argumentation when there are differences of opinion.⁶⁸ The structured process does not guarantee a correct judgment, but it does help to ensure that alternative voices are heard and seriously considered when making the judgment.

Virtual Group Use of Structured Techniques

Many structured analytic techniques can be implemented by virtual teams or mixed virtual and face-to-face teams. The Intelligence Community is in a good position for the use of virtual teaming. Analysts are sufficiently dispersed that frequent attendance at interagency meetings is burdensome, but not so far apart that they can't meet face-to-face when really needed.

Small, distributed, asynchronous groups are particularly good at generating and evaluating lists of assumptions, indicators, drivers, potential explanations of current events, or potential outcomes. They are also good for making lists of pros and cons on any particular subject. With the aid of distributed group support software, the group can then categorize items on such a list or prioritize, score, rank, scale, or vote on them. This is the kind of ground work that provides a solid foundation for further analysis. For such tasks, a distributed asynchronous meeting may be more productive than a traditional face-to-face meeting. That is because analysts have more time to think about their input; they are able to look at their contribution over several days and make additions or changes as additional ideas come to them; and, if rank or position of some group members is likely to have an undue influence, arrangements can be made for all group members to make their input anonymously.

This is a more advanced form of interoffice and interagency collaboration than sharing information on a wiki or posting to a blog on Intellipedia. One basic requirement for the type of interagency collaboration just described is that the work group has a private, password-protected workspace on a secure network to which the group members have access. This feature is projected for the planned A-Space while Intellipedia contains two facets that support a similar function. It will enable small interagency groups to work together using various structured analytic techniques without having to leave their office.

The same procedures can be used with outside experts on an unclassified network. Open source information has rapidly come to play a larger role in intelligence analysis than in the past. Combine this with a disproportionate percentage of Intelligence Community analysts having limited experience, and it suggests an opportunity and need to reconsider how we exploit the world of expertise outside the Intelligence Community. Distributed asynchronous collaboration while using some of the basic structured analytic techniques is one way to tap the expertise of a group of knowledgeable but uncleared individuals. This is discussed further below in connection with use of the Delphi Method.

⁶⁸ Information provided by a senior Intelligence Community educator.

Reframing the Question

A mindset or mental model can be thought of as the frame of reference with which we look at an analytic problem. A group can change that frame of reference, and challenge its own thinking about the problem, simply by changing the question(s) it asks. This is called reframing the question.⁶⁹

Reframing is a generic category of tool for which there are many possible variations. The Intelligence Community already uses two techniques in this category, “What If” Analysis and High Impact/Low Probability Analysis. This author is now developing a new technique called “Premortem Analysis,” which is briefly described here and about which the author will be writing more in the future.

Recent experience reminds us that significant intelligence failures are typically followed by post-mortem investigations to determine what went wrong and learn from the experience. Why not do a Premortem Analysis to learn in advance what could go wrong, and then try to prevent the failure?

The term premortem was first used in the context of decision analysis by Gary Klein in his 1998 book, *Sources of Power: How People Make Decisions*. He reported using it in training programs to show decision makers they are typically overconfident that their decisions and plans will work. After the decision makers formulated a plan of action, they were asked to imagine that it is several months or years into the future, and their plan has been implemented but has failed. They were then asked to describe how it might have failed and, despite their original confidence in the plan, they could easily come up with multiple explanations for failure – reasons that were not identified when the plan was first proposed and developed.

This provided the decision makers with evidence of their overconfidence, and it also demonstrated that the premortem strategy can be used to expand the number of interpretations and explanations that decision makers consider. Klein explains, “We devised an exercise to take them out of the perspective of defending their plan and shielding themselves from flaws. We tried to give them a perspective where they would be actively searching for flaws in their own plan.”⁷⁰ After further experience with this premortem strategy, Klein reported his trainees showed a “much higher level of candor” when evaluating their own plans after they were exposed to the premortem exercise as compared with other more passive attempts at getting them to self-critique their own plans.⁷¹

⁶⁹ This is similar to what is called problem restatement in Morgan Jones' book, *The Thinker's Toolkit* (New York: Three Rivers Press, 1995).

⁷⁰ Gary Klein, *Sources of Power: How People Make Decisions*, (Cambridge: MIT Press, 1998), 71.

⁷¹ Gary Klein, *Intuition at Work: Why Developing Your Gut Instinct Will Make You Better at What You Do*, (New York, Doubleday, 2002), 91.

Ideally, a separate meeting should be held for the premortem discussion so that participants have time prior to the meeting to think about what might have happened to cause the analytic judgment to be wrong. To set the tone for the premortem meeting, analysts should be advised not to focus only on the hypotheses, assumptions, and key evidence already discussed during their group meetings. Rather, they should be encouraged to make an intuitive judgment based on their own life experiences. They should think about how fast the world is changing, how many government programs are unsuccessful or have unintended consequences, and how difficult it is to see things from the perspective of a foreign culture. This will bring a different part of their brain into play when thinking about what could have gone wrong with their analysis.

One expected result is an increased appreciation of the uncertainties inherent in any assessment of the future. Another outcome might be identification of indicators which, if observed, would provide early warning that events are not proceeding as expected. Such modifications might be incorporated within the existing analytic framework.

On the other hand, the premortem may identify problems, conditions, or alternatives that require rethinking the group's original position. In such a case, the premortem has done its job by alerting the group to the fact that it has a problem, but it does not necessarily tell the group how to fix it. If the group must reconsider and revise its analytic judgment, other methods of self-critique come into play for that purpose. For example, the group might explore the following six questions:

- Do additional hypotheses need to be considered?
- Are our key assumptions valid?
- How reliable is our key evidence?
- Was any contradictory evidence ignored?
- Is the absence of evidence a concern?
- Did deception go undetected?

One needs to understand what it is about the Premortem Analysis that enables a group to identify previously overlooked information or relationships? Briefly, there are two creative processes at work here. First, the questions are reframed. Asking questions about the same topic, but from a different perspective, typically elicits different responses. Second, the premortem approach legitimizes and empowers dissent from the previous conclusions. As noted in Part I, many members of small groups suppress their dissenting opinions, leading to premature consensus. In a Premortem Analysis, all members are asked to make a positive contribution to group goals by identifying *weaknesses* in the previous analysis. The author suspects that a Premortem Analysis

might be more effective than other challenge techniques analysts are using now to identify and examine the weaknesses in their own analysis.

Idea Generation

Brainstorming

Brainstorming is a popular method for generating ideas that comes in many forms. Even the basic procedures for collecting and recording ideas during a brainstorming session vary and are called by various names such as structured brainstorming, free-form brainstorming, and silent brainstorming. There is no standard definition of these terms. We would, however, like to call attention to several other potentially useful procedures that fall under the general category of brainstorming but have been adapted for different purposes that make them quite different applications.

Virtual Brainstorming

Virtual brainstorming has several advantages over conventional brainstorming during a face-to-face meeting.⁷² Obviously, it avoids the time and expense of travel to attend a personal meeting. The productivity of face-to-face brainstorming is constrained by what academic researchers on brainstorming call production blocking. Participants have to wait their turn to speak. They have to think about what they want to say, take some physical action to make their input, and pay attention to what input others are making all at the same time. Something always suffers. What it is that suffers depends upon how the brainstorming session is organized. Too often, it is the synergy that can be gained when participants react to each others' ideas.

"Synergy is the ability of an idea from one participant to trigger a new idea in another participant, an idea that would otherwise not have been produced."⁷³ It may be the most fundamental source of gains from brainstorming for intelligence analysis. In synchronous virtual brainstorming, all participants can make their input simultaneously. This means there is nothing competing for a participant's attention when making input or when reading the input of others. In asynchronous virtual brainstorming, participants make their input and read the inputs of others at their convenience. If the brainstorming session is spread over two or three days, it means that participants can occasionally revisit their inputs and the inputs of others with a fresh mind, and this usually generates additional ideas.

⁷² Alan R. Dennis & Mike L. Williams, "Electronic Brainstorming: Theory, Research and Future Directions." Accessed October 2007 at <http://www.bus.indiana.edu/ardennis/wp/>, then click on TR116-1.

⁷³ Alan R. Dennis & Joseph S. Valacich, "Computer Brainstorming: More Heads Are Better than One." *Journal of Applied Psychology* 78 (1993): 531-537.

Another benefit of virtual brainstorming, whether synchronous or asynchronous, is the ability for participants to make their input anonymously if the software needed to support that is available. This is particularly useful in any environment where status or hierarchy influence peoples' behavior. Anonymity is sometimes needed to elicit original ideas as distinct from politically correct ideas.

Brainstorming is usually a two-phase process. First is the divergent process of creating as many relevant ideas as possible. The second is a process of convergence when the ideas are sorted into categories, weeded out, prioritized, or combined and molded into a conclusion or plan of action. The nature of this second step will vary depending on the specific topic, the goal of the brainstorming session, and the available software. It may be conducted online or during a video or telephone conference.

Nominal Group Technique

Nominal Group Technique is a group process for generating and evaluating ideas that is a form of brainstorming but has always had its own identity as a separate technique. It starts with participants writing down their own ideas in response to the focal question, but these are then presented one idea at a time in round-robin fashion. Each idea may be discussed for clarification and to avoid duplication, but may not be evaluated pro or con until all ideas have been presented.

The purpose of doing brainstorming this way is to ensure that no one member of the group can set the direction of the meeting by presenting a series of ideas first. The round-robin routine encourages all members to participate, and they are required to participate equally until they run out of ideas. Another advantage is that all participants are focused on each idea as it is presented, rather than being focused on preparing their own ideas for presentation. This encourages piggybacking on ideas that have already been presented, i.e., combining, modifying, and expanding others' ideas. This type of synergy between ideas is one of the attributes of successful brainstorming. A disadvantage of the round-robin presentation is that the quantity of ideas is usually reduced when members have to wait their turn before they can express an idea.

Starbursting

Starbursting is a form of brainstorming that focuses on generating questions rather than answers. You can use it, for example, to obtain help in defining a research project. Pick an idea, topic, or issue you plan to write about, then brainstorm to identify the questions that need to be answered by your research.

The term starbursting comes from the image of a six-pointed star. At each point of the star, write one of the following six words: Who, What, Why, Where, When, and How. Then brainstorm, using one of these words at a time, to create questions about the topic that begin with that word. Do not try to answer the questions as you go along, just focus on developing as many questions as possible. After generating questions that start with

each of these words, then use the group to either prioritize the questions you will answer or sort the questions into logical categories that help organize your work.⁷⁴

Reverse Brainstorming

Reverse brainstorming is a way to reframe the question to break mental blocks when a brainstorming group has difficulty coming up with good ideas for how to solve a problem or achieve a goal. The trick is to reverse the question and ask: How can we make this problem worse? How can we keep this plan from being successful? This can also be called inverse brainstorming or negative brainstorming.

After answers to the reversed question have been exhausted, go back to brainstorming the original question. Typically, participants will then be able to think of a significantly wider variety of useful answers.⁷⁵

Techniques for Aggregating Expert Opinion

Prediction markets and Delphi Method are alternatives to surveys or traditional group meetings for aggregating expert opinions. Scholars who study group decision making believe that both methods are more efficient and effective for this purpose than traditional face-to-face meetings, but there are significant differences between prediction markets and Delphi in how they work and the circumstances when they are best used.⁷⁶

Prediction Markets

Two recent books, *The Wisdom of Crowds* by James Surowiecki and *Infotopia* by Cass Sunstein, have popularized the concept of prediction markets. These are speculative markets created for the purpose of making predictions. Just as betting on a horse race sets the odds for betting on which horse will win, supply and demand in the prediction market estimates the probability of some future occurrence. Large corporations such as Google, Microsoft, Motorola, Intel, and GE have been using prediction markets to forecast developments and make decisions within their own corporations. Employees, partners, and customers of the corporation who believe they have some insight to the issue in question buy and sell these prediction contracts. The predictions have often proven to be more accurate than the corporations' own internal forecasts. This lends support to the wisdom of crowds theory that "the many are smarter than the few," that is, that the collective wisdom is often smarter than the average expert.⁷⁷

⁷⁴ Information on this technique is available on the MindTools website at <http://www.mindtools.com/pages/article/newCT91.htm>.

⁷⁵ Information on this technique is available on the MindTools website at http://www.mindtools.com/pages/article/newCT_96.htm.

⁷⁶ Kesten C. Green, J. Scott Armstrong, & Andreas Graefe, "Methods to Elicit Forecasts from Groups: Delphi and Prediction Markets Compared," *Foresight: The International Journal of Applied Forecasting* (Fall 2007).

⁷⁷ Surowiecki, *Wisdom*.

Consensus Point, which sells prediction market software to industry, says it can be used to predict next year's revenue, gauge consumer demand for a new product, identify future trends, or determine if a project will finish on time.⁷⁸ A number of prediction markets are open to the public. For example, Intrade manages public markets for trading contracts in the categories of politics, entertainment, financial indicators, weather, current events, and legal affairs. Each contract is for a specific event that will have an unambiguous result. The value of the contract ranges from 0 to 100 points. The contract's value at any given point in time is set by market supply and demand and is, therefore, the market prediction of the probability that this event will occur.⁷⁹

Prediction markets are currently in vogue, and there has been discussion of their use in intelligence analysis.⁸⁰ A Prediction Market Industry Association was recently formed to promote and grow the field of prediction markets.⁸¹ However, this author believes that Delphi is a more appropriate method for intelligence agencies to use to aggregate expert opinion. There may be some circumstances when a prediction market is appropriate, as that method has a strong record of accurate performance when used in a commercial context. However, Delphi has much broader applicability for intelligence analysis as well as other advantages.

Specialists in forecasting have recently compared the strengths and weaknesses of Delphi and prediction markets.⁸²

- Delphi can be used for nearly any forecasting, estimation, or decision making problem. Prediction markets can be used only in situations that will have an unambiguous outcome, usually within a predictable time period. Such situations are commonplace in business and industry, less so in intelligence analysis.
- Markets do have a strong record of near term predictions, but, intelligence analysts and their customers are likely to be uncomfortable with the "black box" nature of the prediction markets. Unlike Delphi, prediction markets provide no explanation of the rationale for their predictions. No matter what the statistical record of accuracy with this technique might be, consumers of intelligence are unlikely to accept any forecast without understanding the rationale for that forecast and who made it. Delphi participants are typically asked to provide comments or reasons for their judgments, which introduces new and useful ideas into the discussion.

⁷⁸ From the Consensus Point website at <http://www.consensuspoint.com>.

⁷⁹ See Intrade website at <http://www.intrade.com>.

⁸⁰ DNI Conference, "Improving Intelligence Analysis: What Works? How Can We Tell? Lessons from Outside the Intelligence Community," Chantilly, VA, January 9-10, 2007.

⁸¹ The website is <http://www.pmindustry.org>.

⁸² Green, Armstrong, & Graefe, "Methods to Elicit Forecasts."

- Like other financial markets, prediction markets are subject to liquidity problems and speculative attacks mounted in order to manipulate the results. The fewer the participants, the more vulnerable they are.
- Ethical objections have been raised to a prediction market for national security issues. The Defense Advanced Research Projects Agency (DARPA) proposed a Policy Analysis Market in 2003. It would have worked in a manner similar to the commodities market and allowed investors to earn profits by betting on the likelihood of such events as regime changes in the Middle East and the likelihood of terrorist attacks. The DARPA plan was attacked on grounds that “it was unethical and in bad taste to accept wagers on the fate of foreign leaders and a terrorist attack. The project was canceled a day after it was announced.”⁸³ There is a legitimate concern about government-sponsored betting on international events.

Delphi Method

The Delphi method was developed at the Rand Corporation at the beginning of the Cold War to forecast the impact of new technology on warfare. It was also used to assess the probability, intensity, or frequency of future enemy attacks. In the 1960s and 70s, Delphi became widely known and used as a methodology for futures research, especially forecasting long-range trends in science and technology. Futures research is similar to intelligence analysis in that the uncertainties and complexities one must deal with often preclude the use of traditional statistical methodologies, so judgments must be based on the experienced and informed judgment of experts.

In a Delphi project, a moderator (analyst) sends a questionnaire to a selected panel of experts who may be in different locations. The experts respond to these questions and may be asked to provide a short explanation for their response. The moderator collates the results from this first questionnaire and sends the collated responses back to all panel members with a request to reconsider their responses based on what they see and learn from the other experts’ responses and explanations. Panel members may then provide feedback to others’ responses or modify their own answers in response to what they have learned from others’ responses, as well as answer another set of questions. In traditional Delphi, this cycle of question, response, and feedback continues through several rounds.

After a second, or sometimes a third, round of questions and feedback, the responses generally stabilize. In most cases, there will be some degree of consensus, but consensus is not the goal. The goal is an accurate representation of how experts are thinking about the issue, which may well include alternative perspectives.

Delphi has a number of advantages.

⁸³ Robert Looney, “DARPA’s Policy Analysis Market for Intelligence: Outside the Box or Off the Wall?”, *Strategic Insight* (September 2003).

- In most Delphi projects, the experts remain anonymous to other panel members so that none may use his or her position of authority, reputation, or personality to influence others. Anonymity also facilitates the expression of opinions that go against the conventional wisdom and may not otherwise be expressed.
- The process of feedback from other experts and opportunity to reconsider initial responses makes it easy for experts to adjust their previous judgments in response to new evidence.
- It identifies any outliers who hold an unusual position. Recognizing that the majority is not always correct, research can then focus on gaining a better understanding of the grounds for any views that diverge significantly from the consensus. In fact, identification of experts who have an alternative perspective and are qualified to defend it might be the objective of a Delphi project.
- Ability to participate from one's home location is certainly convenient and reduces cost in time and travel. This makes it particularly appropriate for use with outside consultants.

Over the years, Delphi has been used by a wide variety of people, in a wide variety of ways, and for an equally wide variety of purposes. This has led to a number of misconceptions that are easily reinforced by the results of a Google search as this author experienced. Two leading scholars on the Delphi process have identified the following misconceptions:

- "It is a method for predicting future events." This is misleading. It can estimate the likelihood or timing of future events, but that is by no means its sole purpose. Applications of Delphi to intelligence analysis are limited only by the analyst's imagination. The process can be used to aggregate expert opinion or identify alternative opinions about past or current developments as well as future outcomes.
- "It is a method for generating a quick consensus by a group." This is incorrect. The Delphi process can lead to a consensus, but that is not its purpose. Its goal is a detailed, critical examination of alternative perspectives.
- "It is a method for quantifying human judgment in a group setting." This is partially incorrect. Delphi does require some form of quantification or scaling, but that is only in order to identify agreement or disagreement between the experts. For example, panel members might be asked to judge on a five-point scale, from most to least, the desirability or feasibility of alternative options, the importance or validity of various arguments for one of these options, or the importance of variables that are likely to influence an outcome.

Although many Delphi projects have focused on developing a consensus of expert judgment, a variant called Policy Delphi is based on the premise that the decision maker is *not* interested in having a group make a consensus decision; but rather in having the experts identify alternative policy options and present all the supporting evidence for and against each option.⁸⁴ Delphi scholars now say the Delphi technique “can be used for nearly any problem involving forecasting, estimation, or decision making” – as long as one can find experts in a position to make knowledgeable judgments on the topic. One reports having used Delphi for such diverse purposes as choosing between regional development options, predicting election outcomes, deciding which applicants should be hired for academic positions, and predicting how many meals to order at conference luncheons.⁸⁵

To show how Delphi might be used for intelligence analysis, the author has developed three illustrative applications.

- *Forecasting:* A panel of experts is asked to estimate the probability of a future event or the relative probability of each scenario in a set of scenarios. Changes in the probabilities can be tracked over time. There are two different ways to manage a Delphi project that monitors change over time. One is a new round of questioning and response at specific intervals to assess the extent of any change. The other is what is called either Dynamic Delphi or Real-Time Delphi where participants can modify their responses at any time as new events occur or new information is submitted by one of the participants. The probability estimates help to identify differences between the experts that may warrant examination. They can also be aggregated to provide an overall forecast or a measure of the amount of change in the probability over time.
- *Analysis of competing hypotheses:* A panel of outside experts is asked to estimate the probability of each hypothesis in a set of mutually exclusive hypotheses where the probabilities must add up to 100%. This could be done as a stand-alone project or to double-check an already completed Analysis of Competing Hypotheses (ACH) analysis. If two analyses using different analysts and different methods arrive at the same conclusion, this is grounds for a significant increase in confidence in that conclusion. If they disagree, that might also be useful as one can then seek to understand the rationale for the different judgments. Alternatively, solicitation of expert advice from a Delphi panel might precede and be used to develop input for an ACH analysis, such as identification of additional items of evidence or arguments or ranking the significance of the known evidence.

⁸⁴ Murray Turoff, “The Policy Delphi,” accessed September 17, 2007, at <http://is.njit.edu/pubs/delphibook/ch3b1.pdf>. For a full report on an application of policy Delphi to national drug policy, see <http://is.njit.edu/pubs/delphibook/ch3b3.html>

⁸⁵ Green, Armstrong, & Graefe, “Methods to Elicit Forecasts.”

- *Red Team evaluation of another country's policy options:* The Delphi project manager or moderator identifies several options and asks the panel members to rate the desirability and feasibility of each option, from the other country's point of view, on a five point scale ranging from Very Desirable or Feasible to Very Undesirable or Definitely Infeasible. Panel members are also asked to identify and assess any other policy options that ought to be considered and to identify the top two or three arguments or items of evidence that guided their judgments. A collation of all responses is sent back to the panel and panel members are asked to either do nothing, reconsider their position in view of others' responses, or to give further explanation of their judgment. In a second round of questioning, it may be desirable to identify key arguments and items of evidence and rate them on their validity in making the decision and their importance, again from the other country's perspective.

A Delphi project involves administrative work to communicate with panel members and collate and tabulate their responses through several rounds of questioning. Several software programs have been developed for this, and one of these is hosted for public use.⁸⁶ The distributed decision support systems now available to support virtual teams include some or all of the functions necessary for Delphi as part of a larger package of analytic tools. Although not designed specifically for Delphi projects, the author believes that several publicly available software packages may have all the necessary functions.

Recommendations

A number of recommendations have been discussed in Parts II and III of this report. They are briefly summarized here.

- Encourage the use of structured analytic techniques as a group activity. The research on small group performance is virtually unanimous in emphasizing that groups make better decisions when their members bring to the table a diverse set of ideas, opinions, and perspectives. When structured analytic techniques are used as a group process, they provide, in effect, a structured procedure for eliciting new information and divergent perspectives.
- Recognize when computer-mediated communication may be more effective than a face-to-face meeting. Under some common circumstances, a virtual meeting may be more effective than a face-to-face meeting even when all participants are located in the same building. If there are more than four or five participants, and the goal is to obtain ideas or information, or to critique or evaluate a specific idea, suggestions can be collected and discussed by e-mail, in a blog, or on a wiki. Computer-mediated communication has the potential to avoid the pitfalls of face-to-face group meetings, especially the reluctance of many people to speak up or to speak candidly in a group

⁸⁶ See <http://armstrong.wharton.upenn.edu/delphi2/>.

meeting. After all the input has been received and distributed back to the group members, a face-to-face meeting may then be appropriate for discussion and convergence on an optimal solution or course of action.

- The Defense Acquisition University's program that sponsors and provides technology support for 15 different CoPs and 25 Special Interest Areas may be a particularly appropriate model for the Intelligence Community.
- Encourage the formation of virtual or mixed (virtual and face-to-face) interagency project teams. Many basic analytic functions can be handled well by distributed, asynchronous teams. These functions include generating and evaluating lists of assumptions, indicators, drivers, potential explanations of current events, or potential outcomes. These provide a solid foundation for further analysis. Support for such interagency and interoffice teams should be provided in the form of distributed group support software and private, password-protected workspaces on Intellipedia and A-Space when it becomes available.
- Consider rethinking the role of outside experts in the analytic process. The development of technology for distributed, asynchronous collaboration, the disproportionate percentage of Intelligence Community analysts with limited experience, and the growing role of open source information are all relatively recent developments that should influence how the Intelligence Community can best benefit from outside expertise. The DNI's operational presence on Intelink-Unclassified and development of the Unclassified version of A-Space that is now under consideration offer two options for this purpose.
- The Intelligence Community might consider adding five structured analytic techniques to its toolbox of analytic techniques. These are Premortem Analysis, Virtual Brainstorming, Nominal Group Technique, Starbursting, Reverse Brainstorming, and Delphi.