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PROBLEM SOLVING AND CREATIVITY

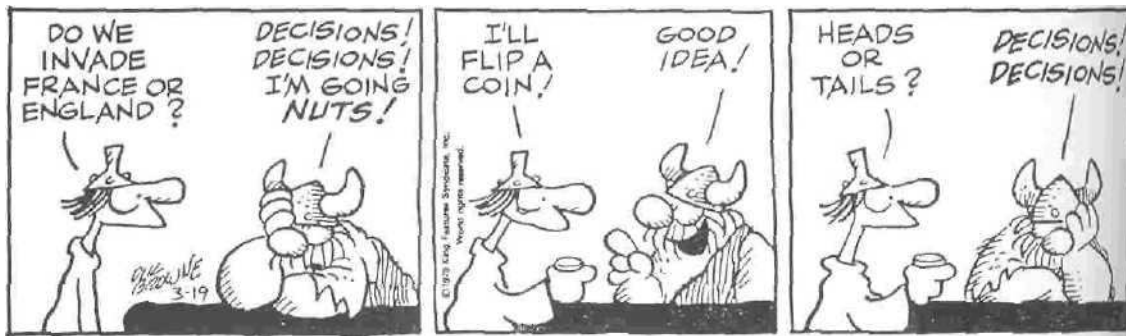
After studying this chapter, you should be able to;

- A Discuss the stages of the problem-solving process.
- ▲ Identify a variety of barriers to effective problem solving.
- ▲ Discuss consequences of difficulties in problem solving, including usage of heuristics.
- ▲ Cite advantages of use of groups for problem-solving purposes.
- ▲ Describe five group problem-solving processes which are alternatives to use of traditional interacting groups.
- ▲ Identify the stages of the creative process.
- A Discuss seven sets of creativity enhancement techniques.
- A Describe the creative organisation.

Consider these organizational decision situations of the 80s:

- A Margarine manufacturers pondered what to do in the face of rumors that Procter & Gamble was going to market sucrose polyester, a fat substitute that looks and tastes like fat but is not absorbed by the body. Sucrose polyester has no calories, can be used like margarine or butter, and actually lowers cholesterol levels.
- A The makers of Tylenol faced the decision of how to respond in the face of deaths caused by poison-lacings of their product.
- A Manville Corporation was saddled with over 16,500 asbestos-related lawsuits and expected tens of thousands more, totalling \$2 billion.
- A A growing number of firms encountered threats of greenmail—hostile takeover bids that could be avoided by expensive settlements with the bidder.
- A Bioengineering firms wondered whether to continue expensive development of gene-spliced products in view of possible governmental restriction of their use for environmental reasons.
- A Margaret Schwartz debated whether to get up and go to work.

In fact, decisions are constantly being made at all levels of organizations. Corporate strategists plot mergers, financial and market gambits, and plant locations. Middle managers consider motivational tools, planning and control techniques, and ways to reduce subordinates' resistance to change. Workers decide whether to go to work, to produce at a certain level, to join informal groups, and to obey orders. Decisions are the fabric of organizations.



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There are a number of reasons why managers are concerned with problem solving. These include the following:¹

- ▲ The decision is the main responsibility of the manager, traditionally, the key distinction between managers and non-managers was that managers made decisions. Recall from Chapter 1 Henry Mintzberg (1975) discussed such decision roles of the manager as resource allocator, negotiator, disturbance handler and entrepreneur. Managers are increasingly being evaluated on their problem-solving ability. So, decisions may affect careers, rewards, and satisfaction of managers.
- A The quality and acceptability of decisions affect organizational performance and the satisfaction of organization members.
- A. Problem solving takes considerable time and effort in organizations and is often uncomfortable. It makes sense to try ten times well on something which we spend so much time and psychological energy.
- ▲ Activities in organizations are generally the results of decisions. By examining how decisions are made, we may be able to understand how organizations work.

In this chapter we will examine problem solving and creativity; we will first consider stages of the problem-solving process. Then, barriers to effective problem solving and the consequences of those barriers will be discussed. Some suggestions for improving problem solving will then be presented, followed by consideration of group problem-solving processes. The chapter will conclude with examinations of the nature of creativity, creativity enhancement techniques, and characteristics of the effective organization.

1. This listing is based primarily on G. P. Huber, *Managerial Decision Making* (Glencview, IL: Scott, Foresman & Company, 1980),

PROBLEM-SOLVING STAGES*

Successful problem solvers recognize that there is more to a good decision than just choosing one option over another. Instead, they follow the five steps in the problem-solving process shown in Figure 16-1.

Problem Definition

Careful problem definition is crucial. Unless proper time and care are taken at this stage, the wrong problem may be solved. A problem occurs when there is a gap between the desired and the actual situation. Declining profits, high scrap rates, or inability to increase market share are all possible problems. Too often, the problem is defined in terms of symptoms. For instance, management may define the problem as employee apathy instead of seeing that apathy as a symptom of a deeper problem. Or, the problem may be defined in terms of a preferred solution. A problem statement such as "Gloria is a poor manager" focuses on proposed solutions relating to Gloria rather than directly addressing the criterion of interest.

Alternative Generation

Alternatives are the various approaches that may be taken to solving the problem. Good solutions require good alternatives. Unfortunate-

Figure 16-1 THE PROBLEM-SOLVING PROCESS

DECISION MAKING



PROBLEM SOLVING

2. For a fuller discussion of these stages, see A. Elbing, *Behavioral Decisions in Organizations*, 2d ed. [Glenview, IL: Scott, foresman & Company, 1978]; Huber, *Managerial Decision Making*-, and B. M. Bass, *Organizational Decision Making* (Homewood, IL: Richard D. Irwin, 1983). Consideration of those stages will reveal that, while problem solving and creativity are treated separately in this chapter, creativity is an integral part of the problem-solving process.

ly, in their rush to judgment, problem solvers often slight the alternative generation stage. At this stage divergent thinking is needed. That is, problem solvers must stretch their minds, seeking new possibilities. Creativity—which we will discuss shortly—is especially important at the alternative generation stage.

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Evaluation and Choice

Once alternatives are thoroughly generated, they can be evaluated and a choice can be made. This stage requires convergent thinking, a narrowing in on a solution. There are two general approaches to evaluation and choice. With screening approaches each alternative is identified as satisfactory or unsatisfactory. Unsatisfactory alternatives are screened out, leaving only those that can clear all hurdles. Scoring approaches assign a total score to each alternative. Then, the alternative with the best score can be chosen. Together, the first three stages of the problem-solving process are called decision making.

Decision Implementation

Some managers make the mistake of assuming the decision process is over once a choice has been made. Unfortunately, decisions don't implement themselves. It is necessary to ensure that resources are available for implementation. It is also important that those who will be involved in implementation understand and accept the solution. For this reason, implementers are often encouraged to participate in the earlier stages of the process.

Decision Control

The final step in the problem-solving process is the monitoring of decision outcomes and taking of necessary corrective action. If decision control is to be effective, steps must be taken to ensure that necessary information is gathered. And, contingency plans must be developed to permit changes if the decision does not turn out well.

As shown in Figure 16-1, problem solving consists of decision making, decision implementation, and decision control.

INFLUENCES ON PROBLEM SOLVING

Figure 16-2 provides a rough outline of the steps information goes through as it is used for problem solving. That is, information available to the manager is perceived and cognitively processed. A

sion is made and implemented. The consequences of the decision are evaluated and stored for use in future problem solving.

Figure 16-2 **FACTORS AFFECTING INDIVIDUAL PROBLEM SOLVING**



The Ideal Decision Situation

Ideally, the decision maker would have all the information needed—and no more—when it was needed and in the desired form. Perception would be used in an unbiased way to select and process the information. The cognitive processes would quickly, accurately, and objectively evaluate the information and arrive at an optimal choice. Subsequent evaluation of consequences would be unbiased and storage would be efficient.

"Real-World" Barriers to Effective Problem Solving

The "real-world" situation is far from this idyllic scenario. Difficulties may occur at each step in the sequence depicted in Figure 16-2.

Information Inputs. Managers are often forced to act on the basis of less than perfect information. It may be incomplete, late, or in the wrong form. There may be too much of it, and it may simply be wrong.

There are many reasons why information may be imperfect. For one, there simply may be too little time to carry out a full information search. And, situations which are rapidly changing and complex make it especially difficult to get good information. Some sorts of problem solv-

ers—including those who are younger, who are risk takers, or who are dogmatic—act on the basis of relatively little information. Their opposites feel especially uncomfortable if information is not abundant.⁵

Perceptual Processes. As we saw in Chapter 3, our perceptual processes can result in a number of distortions. Recall, for instance, that we tend to perceive what we're expecting to perceive. Our perceptual selection is influenced by needs and personality factors and many things other than the nature of the object being perceived. When we interpret information, we are subject to stereotyping, halo error, projection, perceptual defense, and a host of other troublesome influences.

Cognitive Processes.⁴ Human problem solvers also face a variety of cognitive constraints. These include the following:

- A. Our short-term memories are very limited, with a capacity of only a few pieces of information.
- A We are basically serial information processors. That is, we find it difficult to deal with multiple problems simultaneously. As a result, we process information relatively slowly,
 - ▲ We have limited computational ability. The sorts of calculations implied by theories of maximization, such as the Rational Economic Man so popular in microeconomics, cannot be handled without assistance.
 - ▲ Unlike a computer, we care about the outcomes of our decisions. This causes us to have doubts about whether our decision is correct.
- A We evaluate information differently depending on how it is presented to us. Amos Tversky and Daniel Kahneman present the following example to illustrate these framing effects:

3. For studies bearing on the issue of information for problem solving see N. L. Chervany and C. W. Dickson, "An Experimental Evaluation of Information Overload in Production Environment," *Management Science* 20 (1974): 1335-344; B. H. Long and D. L. Ziller, "Dogmatism and Predecisional Information Search," *Journal of Applied Psychology* 65 (1975): 376-78; R. N. Taylor and M. U. Dunnette, "Relative Contribution of Decision-Making Attributes to Decision Processes," *Organizational Behavior and Human Performance* 12 (1974): 286-98; and P. Wright, "The Harassed Decision Maker: Time Pressure, Distractions, and the Use of Evidence," *Journal of Applied Psychology* 59 (1974): 55.

4. See, for instance, H. A. Simon, "A Behavioral Model of Rational Choice," in T. L. L. Alex and C. Wilson, eds., *Organizational Decision Making* (Englewood Cliffs, NJ: Prentice-Hall, 1967); P. Slavic, "Psychological Study of Human Judgment: Implications for Investment Decision Making," *Journal of Finance* 27 (1972): 779-800; R. W. Olson, "Search Limits as a Function of Tree Size and Storage Requirements," *Organizational Behavior and Human Performance* 6 (1971): 336-44; H. A. Simon and A. Newell, "Problem Solving: The State of the Theory in 1970," *American Psychologist* 26 (1971): 59; and R. N. Taylor, "Psychological Determinants of Bounded Rationality," *Decision Sciences* 6 (1975): 409-29.

One group of people was asked the following question:

"Imagine that you have decided to see a play and paid the admission price of \$ 10 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay \$10 for another ticket?"

Another group was asked this question:

"Imagine that you have decided to see a play where admission is \$10 per ticket. As you enter the theater you discover that you have lost a \$10 bill. Would you still pay \$10 for a ticket to see the play?"³

The outcomes of each of these situations are identical: a \$10 cost with no ticket or a \$20 cost with a ticket. But of those faced with the first question, most (54 percent) said they would not buy another ticket. Of those asked the second question, only 12 percent indicated they wouldn't buy the ticket.

To explain this apparent paradox, Tversky and Kahneman propose a **psychological account** in which people keep track of transactions. The loss registers in the "ticket account" in the first case but not in the second.

Group Influences. Groups influence problem solvers in a number of ways, as discussed in the previous chapter. For one thing, they exert pressure for conformity to group norms. For another, they influence the individual's risk preferences, generally in the risky direction for most business-related decisions.

Organizational Influences. Problem solvers act within the context of the organization and are continually influenced by it. For instance, the organizational reward system influences the way decisions are made. If it rewards cautious decisions, the manager will learn to play it safe. If it rewards chance-taking, managers will learn to take risks. Rewards for creativity will reinforce creative decision making.

Time and Cost Constraints. Obviously, time and cost constraints restrict our ability to get good, thorough information. Less obviously, time constraints also may cause us to change the nature of our decision processes. When pressed to make a quick decision, for instance, we may seek out negative information about alternatives in order to screen them out quickly instead of carefully balancing positive and negative aspects.⁶

5. A. Tversky and D. Kahneman, "The Framing of Decisions and the Psychology of Choice," *Science* 211 (January 30, 1981): 453-58. Copyright 1981 by the AAAS.

6. Wright, "The Harassed Decision Maker."

Stress. Decision makers often act under great psychological stress. Especially when the stakes are high, they may find it difficult to react with cool rationality. These **hot decision situations**, as we will see, may lead to inadequate decision making.⁷

Stress is one
barrier all
decision makers
face
occasionally.



PROBLEM SOLVING IN THE FACE OF CONSTRAINTS

The many barriers faced by decision makers have a variety of consequences, some obvious and others not. In view of all the difficulties people face in problem solving, we do remarkably well. For instance, studies show that humans do a very good job of making statistical inferences,

ences.⁸ Further, we may do even better in the "real world" than lab experiments suggest.⁹ Nevertheless, the various barriers we have discussed do hinder problem solving in some important ways.

7. I. L. Janis and L. Mann, *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment* (New York: The Free Press, 1977), provide a thorough discussion of these situations.

8. C. M. Peterson and L. R. Beach, "Man as an Intuitive Statistician," *Psychological Bulletin* 68 (1967): 29-46, provide one good review of "man as an intuitive statistician."

9. For instance, see R. M. Hogarth, "Beyond Discrete Biases: Functional and Descriptive Rational Aspects of Judgmental Heuristics," *Psychological Bulletin* 90 (1981): 197-117.

Use of Heuristics¹⁰

In his fascinating volume *Hen's Teeth and Horse's Toes*, paleontologist Stephen Jay Gould writes:

"When I first went to sea as a petrified urbanite who had never ridden anything larger than a rowboat, an old sailor [and Navy man] told me that I could chart my way through this *aqua incognita* if I remembered but one simple rule for life and work aboard a ship: if it moves, salute it; if it doesn't move, paint it."¹¹

Gould sees the humor of this statement as residing in:

.. . the incongruity of placing such a "mindless" model for making decisions inside a human skull. After all, the essence of human intelligence is creative flexibility, our skill in grasping new and complex statements—in short, our ability to make (as we call them) judgments, rather than to act by the dictates of rigid, preset rules .. . Our enlightened sailor, no matter how successful at combating rust or avoiding the brig, is not following a human style of intelligence.¹²

Actually, there is quite a bit of evidence that humans, no matter how potentially creative or capable of judgment, nevertheless do often behave according to simple guidelines much like those of Gould's "enlightened sailor." The human decision maker, especially when faced with complex decisions such as those faced by managers, shows a combination of creativity and reflex, of judgment and mindlessness.

Heuristics (from the Greek word *heuriskein*, meaning to find or discover) are devices we use—often without knowing it—to simplify decision making. They are simplifying rules of thumb. While they typically do make things easier for the decision maker, they generally result in less than optimal solutions. Here are some that seem quite important:

- ▲ **Satisficing** means choosing the first acceptable alternative rather than looking for the best. So, instead of trying to find the sharpest needle in a haystack, we may stop searching once we have located the first needle.¹³ Satisficing is certainly a time-saver, since we don't have to gather information about all alternatives, only those we consider before making a choice. The problem with satisficing, of course, is that a far better candidate

10. See A. Tversky and D. Kahneman, "Judgment under Uncertainty: Heuristics and Biases," *Science* 185(1974): 1124-131 for a good discussion.

U.S. (J. Gould, *Hen's Teeth and Horse's Toes* [New York: W- W, Norton & Company, 1983], 46. Reprinted with permission.

12. Ibid.

13. J. G. March and H. A. Simon, *Organizations* [New York: John WUey & Sons, 1958]

may be one or two or three alternatives down the list. That alternative will never even be considered. Often when we are faced with a great amount of information, such as the full resumes of a large number of job candidates, we may simply ignore most of the information and focus only on one or two attributes, such as previous experience and physical appearance.

Representativeness is the tendency to place something in a class if it seems representative of the class. So, if someone looks like an astronaut to us, we might classify that person as an astronaut, despite the fact that there are very few astronauts. Representativeness can have serious consequences since it is closely related to stereotyping. For instance, if we think that men "look like" executives and women "look like" secretaries, we may behave accordingly. This could result in hiring or promotion biases against women.

Availability is the tendency to estimate a probability of an event on the basis of how easy it is to recall examples of the event. Amos Tversky and Daniel Kahneman (1974) used the following example to illustrate: Is it more likely that a word in the English language starts with the letter *r* or has *i* as the third letter? Most subjects incorrectly guess that *r* is more common as the first letter. The reason for this is that we store information by the first rather than the third letter (witness the phone directory) and can thus retrieve it more easily on that basis. As another example, because certain causes of death are more likely than others to receive publicity in the newspapers and elsewhere, they are more available in our memories than are others. As a result, we tend to overestimate their probabilities.¹⁴ When we are faced with a sequence of information, it is **often** difficult to combine it all properly to come up with a solution. For instance, in one study two groups of high school students were given five seconds to estimate a numerical expression on the blackboard. One group was instructed to estimate the product:

$$8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

The other estimated the product:

$$1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$$

[4. On this specific point, see S. Lichtenstein et al., "Judged Frequency of Its Events," *Journal of Experimental Psychology: Human Learning and Memory* 4 (1978): 157-78. For a detailed discussion of the availability heuristic, see A. Tversky and D. Kahneman, "Availability: A Heuristic for Judging Frequency and Probability," *Cognitive Psychology* 16 (1973): 207-32.

The median estimate for the first group, with the descending sequence, was 2,250. For the second group, with the ascending sequence, it was 512. The correct answer is 40,320.¹⁵

Anchoring and adjustment is the tendency to use an early bit of information as an anchor and then use new information to adjust that initial anchor. If all that new information were properly weighted this would be fine. However, we tend to give too little weight to new information. So, insufficient revision resulted in both estimates being too low for both groups in the example. The first group started with a higher initial anchor and thus came up with a higher, but still insufficient, estimate.

Managers do use heuristics, but they may not know it. For instance, Enzo Valenzi and I. R. Andrews (1973) found that job interviewers were unaware that they used simplifying procedures in making their judgments.

Procrastination

Because we find decision making to be uncomfortable, we may put off announcing a decision as long as possible. This procrastination delays the time at which we commit ourselves to the decision, and thus at which it is difficult for us to reverse it. We may justify our delay on the grounds that we are using the time to gather additional information. Secretly, we may be wishing that the problem would simply go away.

Incrementalizing

Suppose you were asked to design a perfect mousetrap. How would you begin? Most people would think of the best currently available mousetrap, perhaps the Ronco Rat-O-Matic, and then begin to revise it bit by bit, adding a better spring or disposal mechanism. This procedure of changing one attribute a little and then another is called **incrementalizing**.¹⁶ While incrementalizing may be appropriate if only a "somewhat better" product is needed, it can seriously stifle truly creative alternatives.

Conservatism in Information Processing

Consider the following "experiment":

...Let us try an experiment with you as subject. This bookbag contains 1,000 poker chips. I started out with two such bags, one contain-

15. This example is from Tversky and Kahneman, "Judgment under Uncertainty." 16- This choice mode was first proposed by C. E. Lindblom, "The Science of Muddling Through" *Public Administration Review* 19 [1959]: 79-88.

ing 700 red and 300 blue chips, the other containing 300 red and 700 blue. I flipped a fair coin to determine which one to use. Thus, if your opinions are like mine, your probability at the moment that this is the predominantly red bookbag is 0.5. Now, you sample, randomly, with replacement after each chip. In 12 samples, you get 8 reds and 4 blues. Now, on the basis of everything you know, what is the probability that this is the predominantly red bag? Clearly it is higher than 0.5. Please don't continue reading until you have written down your estimate.¹⁷

The typical subject gives an estimate for this problem ranging between 0.7 and 0.8. The correct answer, 0.97, is much higher. In general, we tend to show conservatism in information processing, characterized by underrevision of our estimates when presented with new information. Conservatism can have serious consequences for decision making. *&

Attempts at Dissonance Reduction

As discussed in Chapter 3, cognitive dissonance is tension produced. Individuals take a variety of actions, including search for confirming information, distortion of attitudes, and avoidance of disconfirming information, to justify their decisions. As a result, decision makers are likely to overestimate the quality of their past decisions.

Decision Confirmation

Dissonance reduction which occurs prior to announcement of a decision has been called decision confirmation. Peer Soelberg [1967] showed, for instance, that by studying students' decision processes, he could identify their job choices weeks before they announced them; According to Soelberg, the students actually made a decision fairly early in the process. The remainder of the process was spent building a case for the preferred alternative. Then, when they finally announced a decision, they could present a strong argument in its favor.¹⁹

Defensive Avoidance

Irving Janis and Leon Mann (1977) have argued that psychological stress in hot decision situations can result in errors in scanning of alternatives.

17. "Conservatism in Human Information Processing," by W. Edwards. In E. Kleinmuntz, ed., *Formal Representation of Clinical Judgment*. Copyright © 1958 by John Wiley & Sons, Inc. Reprinted by permission of John Wiley & Sons, Inc.

18. See Edwards, "Human Information Processing," and H. J. Einhorn, "Overconfidence in Judgment," *New Directions for Methodology of Social and Behavioral Sciences* (1980): 1-16, for discussions of explanations for this tendency.

19. See W. F. Glueck, "Decision Making: Organization Choice," *Personnel Psychology* 27,(1974): 77-93; and D. J. Power and R. J. Aidag, "Soelberg's Job Search and Choice

tives. When a hot situation—such as a major decision, an impending attack, or major surgery—occurs and it looks like important goals cannot be met, stress increases. This stress is especially great if someone—such as a confirmed smoker hearing the Surgeon General's warnings—is committed to a course of action which is challenged by new information. As stress grows, there is a tendency to lose hope of finding a better solution to the decision conflict and defensive avoidance occurs. This is a condition in which the individual avoids information about risks of the chosen alternative, or opportunities associated with an unchosen alternative.

According to Janis and Mann, a state of defensive avoidance is characterized by:

- A Lack of *vigilant* search;
- ▲ Distortion of the meanings of warning messages;
- ▲ Selective inattention and forgetting; and
- ▲ Rationalizing.

Defensive avoidance is at the heart of groupthink, discussed in the previous chapter.

IMPROVING PROBLEM SOLVING

The preceding discussion has highlighted the difficulties faced by an unassisted problem solver. Fortunately, individuals can take steps to improve their problem solving in organizations. They can, for instance:

1. Try to be aware of the various barriers to effective problem solving. Simple awareness may help overcome some biases and other problems.
2. Practice self-assessment concerning decision-related characteristics.
3. Be careful to move systematically through the problem-solving process. As we have suggested, there is more to problem solving than choice. Failure to give all stages the attention they deserve can lead to poor decisions.
4. Take steps to ensure that the information you use for problem solving is complete and accurate. This issue was discussed in Chapter 13.
5. Use processes and techniques to generate a large number of unique alternatives. These creativity enhancement techniques will be discussed later in this chapter.
6. Consider use of computers to complement the human problem solver. We will discuss this possibility in Chapter 18.

Model: A Clarification, Review, and Critique," *Academy of Management Review* 10 11985): 48-58, for further discussions of decision confirmation.

7. Apply systematic tools to assist with evaluation and choice.
8. Review basic statistics to help with probability estimation and revision and other activities relevant to problem solving.
9. Consider using a group problem-solving process. We will address this issue in the next section.

GROUP PROBLEM SOLVING

Relative to individuals, groups have a number of potential benefits for problem-solving purposes.²⁰ They include the following:

- A Groups bring a variety of perspectives and expertise to the problem. This may result in generation of a larger number of alternatives and of more relevant information to evaluate those alternatives.
- ▲ Participation in problem solving generally results in greater member acceptance and understanding of decisions. In many instances, such acceptance may be as important as quality of ultimate decision success.
- ▲ When working in the presence of others, individuals experience social facilitation effect. This is a heightened arousal level which, except when individuals are learning a new task, generally translates into improved performance.
- A With a number of inputs to the decision, individual biases, day-to-day mood swings, and other sources of unreliability are dampened. Since a decision cannot be valid if it is not reliable, this should result in improved decision quality.²¹

In addition, as we've mentioned previously, use of groups increases the propensity for risk taking. For most business-related decisions, groups make riskier decisions than individuals.²² So, if there is concern that decisions have been overly cautious, use of groups may be appropriate. And, group members tend to conform to group norms. If those norms sit congruent with organizational goals, such conformity may be beneficial.

20. This listing is based primarily on N. R. F. Maier, "Assets and Liabilities in Group Problem Solving: The Need for an Integrative Function," *Psychological Review* 74:239-49.

21. Reliability is important even in the case of a one-time decision. For instance, a bathroom scale gives a different weight each time we stand on it, it is unreliable. Even though we might wish to use the scale only once, the unreliability of the scale would cause us to be concerned about the validity of its reading.

22. This issue was discussed in the previous chapter.

Traditional Interacting Groups

While groups have a number of potential benefits, we all know that they can also be frustrating. We have all been in groups in which we really feel that we should be getting back to work.

In fact, traditional interacting groups—of which the ubiquitous and much maligned committee is a prime example—are prone to a variety of difficulties. For one thing, of course, groups consume a tremendous amount of member time. Group decisions tend to be slow, and when elapsed time to the decision is multiplied by the number of group members, the difference in time taken by groups and individuals is substantial. Other interacting group difficulties include these:²³

- A Dominant or stubborn personalities may control the group process, making it difficult for others to make their views known.
- A For a variety of reasons, some members may sit back and make few inputs. Such reluctance to participate may arise from a fear of looking foolish, from threats of sanction, or from a desire to defer to members with higher status. It may also take the form of social loafing, in which members don't exert full effort because they expect others to carry the load.
- A The group may rush through the problem-solving process. For instance, there is a tendency, called focus effect, for groups to focus on just two or three alternatives, begin evaluating them, and never fully generate other alternatives.
- A Group members may be less concerned with achieving the group's goals than with their own personal goals. They may, for example, become so sidetracked in trying to win an argument that concerns about group performance and cohesion may be slighted.
- A Group members may overemphasize concurrence seeking at the expense of realistic appraisal. This groupthink phenomenon was discussed in the previous chapter,

Together, these tendencies serve to diminish or neutralize the potential benefits of groups. Benefits of participation, of dampening of unreliability, and of a large number of inputs are effectively lost.

The Nominal Group Technique

The nominal group technique (NGT) uses both interacting and noninteracting group processes. Noninteracting groups are called

23. See, for instance, A. L. Dclbccq, A. H. Van de Ven, and D. H. Gustafson, *Group Techniques for Program Planning* (Glenview, IL: Scott, Foresman & Company, 1975)

Academic Profile

ANDRE L. DELBECQ



Andre L. Delbecq (D.B.A., Indiana University) is Dean of the Graduate School of Business at the University of Santa Clara. His research focuses on managerial decision-making techniques, developmental planning, and organizational design for facilitating innovation. He is the developer of the nominal group technique and the program planning model. Professor Delbecq has authored books on organizational decision making and on the nominal group technique and the Delphi process as well as a management readings book. His articles have appeared in the *American Sociological Review*, *Administrative Science Quarterly*, *Academy of Management Journal*, *Academy of Management Review*, and elsewhere. He has served on the board of governors and as chair of the Public Sector Division of the Academy of Management and on the editorial boards of the *Academy of Management Journal*, *Academy of Management Review*, and *Health Services Research*. He is a fellow of the Academy of Management. Professor Delbecq has served as an international consultant, lecturer, and trainer.

Q: What led to the development of the nominal group technique?

A: NGT was developed to respond to efforts in the late sixties and early seventies to involve a variety of points of view in public dialogue. This was the period of "maximum feasible participation." Community representatives were asked to officially participate in forming strategy for social programs. This era also saw the evolution of regulatory agencies for the coordination of urban and social services: regional planning bodies, environmental coordinating agencies, health planning councils, etcetera. In all of these efforts, there was a need for a process which would allow diverse constituencies to contribute to and arrive at decisions regarding the identification of needs, the development of solutions, and the specification of priorities despite the widely varied backgrounds, conceptual orientations, and language structures among the participants. For these applications, a structured process was critical.

Q: How widespread is current use of NGT?

A: The technique is virtually a universal tool in developmental planning efforts in the public and service sectors. NGT has also been utilized for peer group quality control in medical and professional settings. Professor David Brown of Boston University indicated that during a World Health Conference in a small village in Botswana Africa, when introducing the technique, one of the local participants looked up and cheerfully said, "Ah yes, NGT!"

In the private sector NGT is also a much utilized protocol, particularly where diverse technological perspectives have to be integrated in the estab-

lishment of strategic plans. Companies also use NGT in quality control and employee participation efforts. Finally, in recent years there has been substantial adaptation of the technique for computer conferencing, allowing a merger between NGT processes and computer networks. **Q:** How would you characterize the evidence concerning the effectiveness of NGT?

A: If one utilizes market acceptance as a criterion, there can be no question that NGT is perceived as one of the most effective idea-generating techniques available. Scientifically, evidence concerning structured versus less structured techniques has yielded varied results. My own interpretation is that structured processes are particularly important in circumstances where one is trying to meld heterogeneous groups who do not share common cognitive orientations and communication skills. Given the absence of control regarding both the purpose-scope using a structured process as well as group composition, it is not surprising the empirical evidence is mixed.

Q: Do you have any suggestions for people who are thinking of using NGT for the first time?

A: Essentially, I would suggest the novices follow the rules as set forth in the handbook *Group Techniques for Program Planning*. In the beginning following the specific protocol seems to "allow work." However, once one gains experience there emerge many intriguing modifications and adjustments of NGT. Like everyone's favorite four-letter word, drive vehicle, people adjust, modify, add and subtract.

coacting groups—because the members are jointly acting toward some goal—or nominal groups—because they are groups "in name only." Developed by Andrew Van de Ven and Andre Delbecq (1971), the NGT tries to capture the benefits of groups without falling prey to their problems. It does this by avoiding interaction at early and late stages in the process. Interaction is used only at the evaluation stage, when multiple views are needed to weight factors and synthesize material. The steps in the nominal group technique are presented in Figure 16-3.

Figure 16-3 STAGES IN
THE NOMINAL GROUP TECHNIQUE

1. Members of the group (called the target group) are selected and brought together.

2. If the group is very large, it is broken down into subgroups of eight or fewer members. This is necessary to prevent the process from being extremely time consuming.

3. The group leader presents a specific question, for instance, the question might be "What are some ways to improve creativity in our new product development department?" or "What are the causes of the high absenteeism in this division?"

4. Individual members silently and independently write down their ideas. This is a nominal (noninteracting) stage.

5. Each group member (one at a time, in turn, around the table in a round-robin fashion) presents one of his or her ideas to the group without discussion. The ideas are summarized and written on a blackboard or sheet of paper on the wall.

6. After all individuals have presented their ideas, there is a discussion of the recorded ideas for the purposes of clarification and evaluation. This is the interacting stage.

The meeting ends with a silent independent voting on priorities by individuals through a rank ordering or rating procedure. The "group decision" is the pooled outcome of the individual votes.

Source: Based on A. L. Delbecq, A. H. Van de Ven, and D. H. Gustafson, *Group Techniques for Program Planning* (Glenview, IL: Scott, Foresman & Company, 1966-69). Reprinted with permission.

Use of nominal groups at early stages of the process may have a number of benefits, including these:²⁴

24. These are drawn from A. H. Van de Ven and A. I. Delbecq, "Nominal versus Interacting Groups for Committee Decision-Making Effectiveness," *Academy of Management Journal* 4,(1971): 203-12.

- A Evaluation is avoided while alternative solutions are being generated. This prevents focus effect and reduces the danger that the search for alternatives will end too soon.
- ▲ Each individual has time to search for solutions and is forced to¹ record her or his ideas. Thus, minority opinions are expressed and everyone makes an input.
- ▲ The search process is proactive rather than reactive. That is, group members must come up with their own original ideas rather than just responding to or building upon the ideas of others.
- ▲ Strong personality types cannot dominate the process.
- A Since ideas are expressed in writing, there is a greater feeling of commitment and a greater sense of permanence than spoken expression produces.

So, the nominal group technique is designed to reduce problems associated with interacting groups while still capturing the benefits of a large number of inputs, feelings of participation, and social facilitation effect.

The NGT has been widely adopted. Research concerning its effectiveness for generating a large number of unique alternatives, minimizing errors, and satisfying group members has generally been quite positive/

The Delphi Process

Many situations require inputs from a large number of individuals; who, for one reason or another, can't feasibly be brought together. It may be the case, for instance, that:²⁶

- A The individuals may be widely scattered geographically. A They may have time constraints that prevent them from getting together.
- A They may want to remain anonymous. A They may not get along well with one another. A The problem may be so broad as to require many diverse inputs

The Delphi process, developed by Norman Dalkey and his associates at the Rand Corporation, was designed for such situations. Because its early applications were for forecasting, the process takes its name from

I

25. See T. B. Green, "An Empirical Analysis of Nominal and Interacting Groups," *Academy of Management Journal* 18 [1975]: 63-73; W. R. Street, "Brainstorming by Individuals, Coacting and Interacting Groups," *Journal of Applied Psychology* 59 [1974]: 433-437; and A. H. Van de Ven and A. L. Delbecq, "The Effectiveness of Nominal, Delphi, and Interacting Group Processes," *Academy of Management Journal* 17 (1974): 605-21.

26. This listing is based on M. Turoff, "Delphi and Its Potential Impact on Information Systems," *AFIPS Conference Proceedings* 39 (1971): 317-26.

the Oracle of Delphi. More recently, the Delphi process has been used for many other purposes, including delineating pros and cons of policy options, gathering data, examining significance of historical events, putting together the structure of a model, and clarifying human interactions through role-playing concepts.²⁷

Delphi has taken on many shapes, but it basically relies on a process in which individuals respond to a series of mailed questionnaires. The steps of the Delphi process are presented in Figure 16-4.

The hope of the Delphi process is that after a series of iterations some consensus among participants will emerge and that such consensus will be on a correct solution. By preserving anonymity, Delphi may encourage members to voice unique opinions. Further, Delphi shares with the nominal group technique such benefits as a block of time devoted to alternative generation, proactive search, written expression of ideas, and a structured process. It is, though, very time consuming, requiring weeks or months to complete. Also, participants have to be highly motivated or they won't return questionnaires on time, if at all. Finally, Delphi participants miss the opportunities for verbal clarification of questions and for face-to-face problem solving.²⁸

Social Judgment Analysis

Often, people disagree without knowing why they disagree. For instance, in the experiment by Valenzi and Andrews mentioned earlier in the chapter, interviewers rated secretarial job applicants on the basis of information relating to such factors as typing speed, experience, and education. They found that, even though employment interviewers agreed fairly well about the relative importance of the attributes, they made substantially different choices. Often, in fact, they were unaware of how they were actually using information to make their choices.

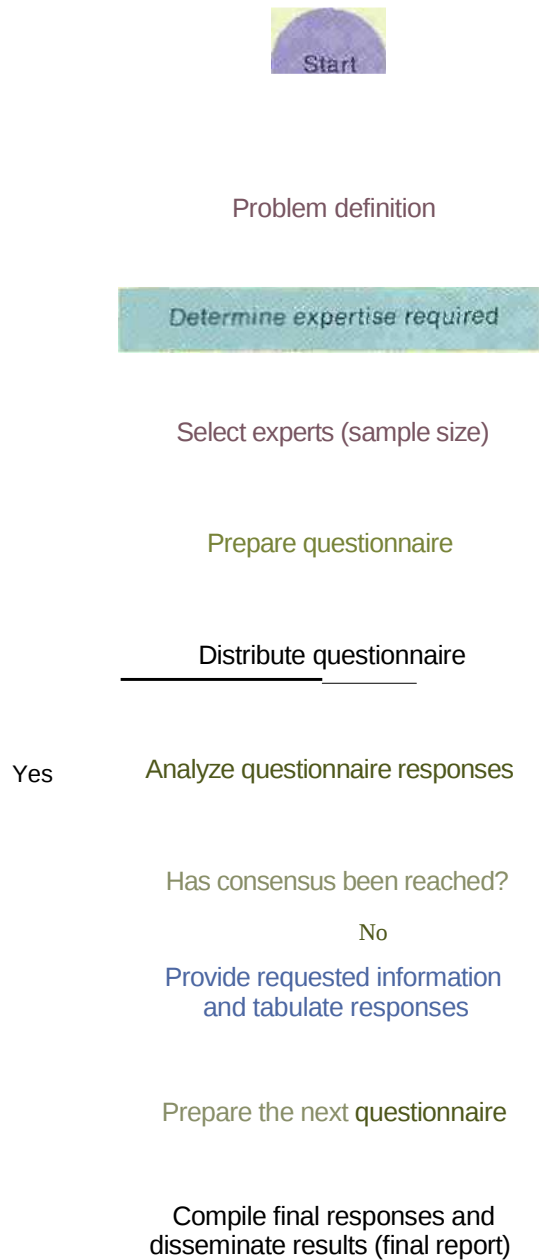
Social judgment analysis is based on the idea that disagreements could be reduced if members, instead of voicing their choices, could explain how they arrived at those choices.²⁹ To accomplish this, social judgment analysis presents a series of tasks to participants. On the basis of their choices, statistical procedures are used to determine the underlying models that were used in reaching those choices. Then, pictorial representations of those models are developed and given to the participants. The participants then are encouraged to compare and contrast their policies with those of others. Finally, they interact and attempt to agree on a final policy.

27. *Ibid.*

28. See Delbecq, Van de Ven, and Gustafson, *Group Techniques*, for a thorough discussion of the Delphi process. See also J. Rohrbaugh, "Improving the Quality of Group Judgment: Social Judgment Analysis and the Delphi Technique," *Organizational Behavior and Human Performance* 24 (1979): 73-92.

29. *Ibid.*

Figure 16-4 STEfcS 'ffi TJM DELPHI PROCESS



Source: Copyright, 1976, by the Foundation for the School of Bustuess at Indian University. Reprinted by permission.

Automated Decision Conferencing³⁰

When important, complex decisions must be made in a very short time, automated decision conferencing (ADC) is becoming popular. An automated decision conference usually lasts 2 or 3 days and may involve 6 to 15 executive *team* members and 3 staff members. With the aid of the staff members, who are trained in computer skills, quantitative techniques, and organizational development, the executive team works on a major organizational problem.

Once a problem is clearly identified, the group leader describes it in detail and it is entered on a decision support system by a staff member. As the process continues, additional information is entered on the computer and quantitative aids are used. The completed computer output is subsequently presented to the group and is carefully reviewed. It is then refined until a mutually acceptable solution is achieved. Because of computer support, complex decisions requiring large amounts of information can be attacked in an open group process.

Synthetic Groups

Finally, it may be possible to capture many of the benefits of groups, especially heightened reliability of decisions, without actually using a group process. That is, a synthetic group opinion can be achieved by simply aggregating individual decisions mathematically. Such aggregation has been shown to markedly improve probability estimates and forecasts.³¹

DESIGNING GROUPS FOR PROBLEM SOLVING

Managers are often faced with the task of choosing which group structure to use and how to staff the group. Stephen Stumpf, Dale Zand, and Richard Freedman (1979) have presented a model to make this task a bit more manageable. Their model helps to answer these questions:

- ▲ Should I use an interacting group, the nominal group technique, or the Delphi process?
- ▲ Should I staff the group with representatives of affected parties, experts, or individuals from within the unit making the decision?

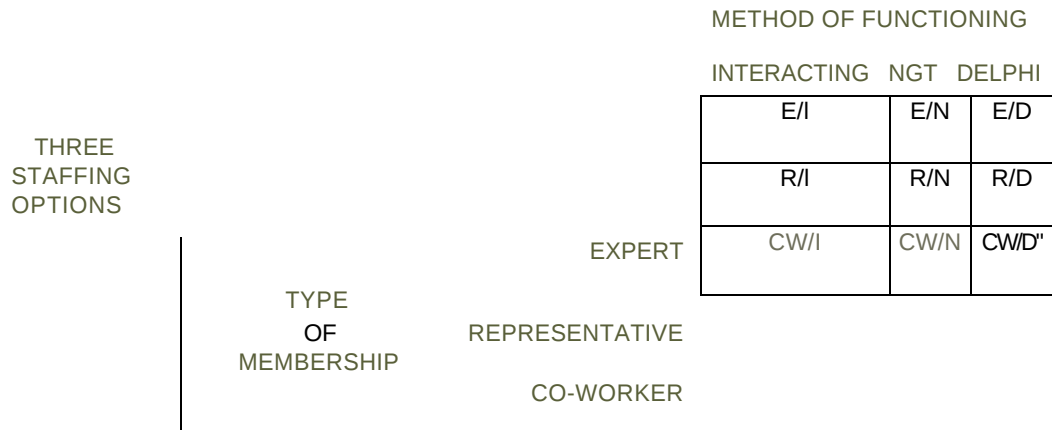
30. This section is based on R. E. Quinn and J. Rohrbaugh, "How to Improve Organizational Decision Making: A Report on Automated Decision Conferencing," working paper (Institute for Government and Policy Studies, Rockefeller College of Public Affairs and Policy, State University of New York at Albany, 1983).

31. For instance, see G. P. Huber, "Methods for Quantifying Subjective Probabilities and Multi-Attribute Utilities," *Decision Sciences* 5 (1974): 430-58.

As shown in Figure 16-5, there are nine combinations of functioning and staffing options.

Figure 16-5

DESIGNING JUDGMENTAL DECISION GROUPS



APPROPRIATE CELL IS CHOSEN ON THE BASIS OF:

THREE DECISION CRITERIA	THREE SITUATIONAL CONDITIONS
QUALITY	DECISION SPAN
ACCEPTABILITY	AVAILABILITY OF EXPERTISE
ORIGINALITY	POTENTIAL FOR INTRAGROUP CONFLICT

*The CW/D combination is improbable and is not considered in the model.

Source: Adapted from Stephen A. Stumpf, Dale E. Zand, and Richard D. Freedman, "Designing Groups for Judgmental Decisions," *Academy of Management Review* 4 (1979): 593. Reproduced with permission.

To choose from among those options, the model asks a series of **six** questions concerning decision criteria and situational factors. The decision criteria are quality, acceptability, and originality. The situational factors are decision span (the number of people affected by the decision), availability of expertise within the group, and potential for intragroup conflict. On the basis of the answers to those questions, certain combinations are eliminated. The elimination criteria are presented in Figure 16-6.

The model for designing a judgmental decision group is presented in Figure 16-7. As in the Vroom and Yetton model, the elimination process results in a preferred set of alternatives. The preferred set for each path number is presented under the model. For instance, if the series of answers leads to Path 6, an interacting group made up of representative* of interest groups is recommended.

As with the Vroom and Yetton model, it is probably more important that the logic of the model be understood than that the model be

Figure 16-6 ELIMINATION CRITERIA IN THE STUMPF, ZAND, AND FREEDMAN MODE

1. The Delphi process is not good if acceptance is important but originality is not. So: If acceptance is important but originality is not, eliminate Delphi.
2. If quality is important but acceptance is not, use of representatives may be dysfunctional. So: If quality is important but acceptance is not, eliminate representative groups.
3. If acceptance is important but quality is not, use of experts may be inhibiting. So: If acceptance is important but quality is not, eliminate expert groups.
4. Interacting groups do not promote originality. So: If originality is needed, eliminate interacting groups.
5. If acceptance is important and there is a broad decision span, co-worker groups probably will not be effective. So: If acceptance is important and decision span is broad, eliminate co-worker groups.
6. If acceptance is important and there is a narrow decision span, use of experts or representatives may be dysfunctional. So: If acceptance is important and decision span is narrow, eliminate expert and representative groups.
7. If expertise is not available in the group, co-worker groups are not likely to be effective. So: If expertise is not available within the group, eliminate co-worker groups.
8. If acceptance is important but originality is not, and if there is high potential for intragroup conflict, Delphi and the nominal group technique are not likely to be effective. So: If acceptance is important but originality is not, and if conflict potential is high, eliminate NGT and Delphi.

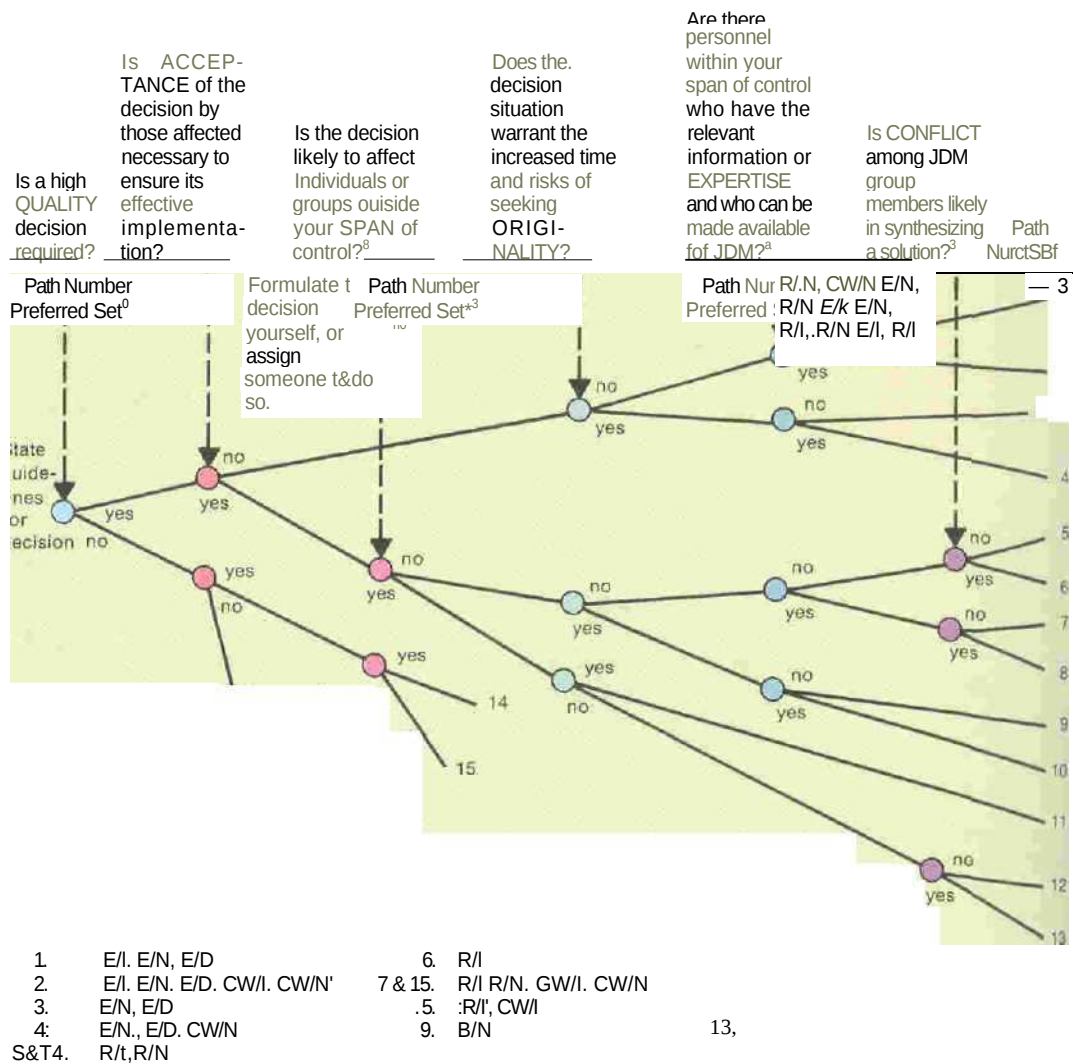
Source: Adapted from Stephen A. Stumpf, Dale E. Zand, and Richard D. Freedman, "Designing Groups for Judgmental Decisions," *Academy of Management Review* 4 [1979]: 596. Reprinted with permission.

memorized. That is, the model suggests that when groups are to be organized and staffed, consideration should be given to the decision criteria which are important and to such situational factors as decision span, availability of expertise, and likelihood of conflict among group members.

The developers of the model have provided some experimental evidence in support of the model.³² Their results demonstrated that interactions among group membership, group functioning, and the decision situ-

32. S. A. Stumpf, R. D. Freedman, and D. E. Zand, "Judgmental Decisions: A Study of Interactions among Group Membership, Group Functioning, and the Decision Situation," *Academy of Management Journal* 22 [1979]: 765-82.

Figure 16-7 DESIGNING A JUDGMENTAL DECISION GROUP



^aThe absence of a node means that the parameter is not relevant to that path.

^bSee definitions of group type in Table 1.

Source: From Stephen A. Stumpf, Dale E. Zand, and Richard D. Freedman, "Designing Groups for Judgmental Decisions," *Academy of Management Review* 4 (1979): 597. Reproduced with permission.

ation affected decision effectiveness. Combinations predicted by model to be ineffective were in fact less effective than those consistent with the model.

CREATIVITY IN ORGANIZATIONS

Polaroid, once called by its founder Edwin Land "a noble prototype of industry" was by the mid 1980s facing a letdown. Land had resigned in 1982. Now many key personnel were leaving and there was a feeling that the company was losing its spark, spending less on research for new technology and more on improvement of current offerings. An employee who resigned said, "The last few years it was control costs, manage this, manage that. The glamor, the excitement, the flair wasn't there." One former director bemoaned the loss of creative risk-taking, saying, "Land grasped at high-risk opportunities. If you aim toward taking advantage of existing products, you can go into a vicious spiral. You search for small differences. Eventually, changing a package becomes a new product."³³

This unraveling of the creative fabric is not unique to Polaroid. Many firms, especially those which face growing bureaucratic entanglements, find that innovation is being stifled. And, as previous chapters have suggested, organizational environments are becoming more complex, dynamic, and uncertain. Such conditions demand flexibility and

sive to environmental demands. Further, creativity is important at all levels of the organization, not just in research labs and the CEO's office.

A CREATIVE ATTEMPT TO SAVE JOBS AT GE

When General Electric decided to close its Charleston, South Carolina steam turbine plant, with a resultant loss of 450 jobs, the union and workers decided that a bit of creativity was in order. The United Electrical Union formed an "Alternative Use Committee" to come up with new ways the plant could be used. The committee presented management with a list of 11 ideas for products that could be made at the plant, including User-tool systems, jet-engine parts, and modular systems for factories in space.

Source: Reprinted by permission of *The Wall Street Journal*, ©EIPW Jones Company, Inc. [September 4, 1984]. All Rights Reserved.

In the following sections we will consider the nature of creativity, some specific creativity enhancement techniques, and the characteristics of the creative organization.

. These quotes are drawn from *The Wall Street Journal* (May 10, 1983), 20.

Motivation and a proper setting may be necessary for creative output.



THE NATURE OF CREATIVITY

Creative behavior is defined as production of ideas that are both new and useful. Creative ability is the ability to produce ideas that are both new and useful. These definitions may seem constraining since the usefulness of some truly creative alternatives might not be immediately evident. Sainoff Mednick has addressed this dilemma by differentiating between originality and creativity. According to Mednick, "... 7,363,474 is quite an original answer to the problem 'How much is $12 + 12$;' However, it is only when conditions are such that the answer is useful that we can also call it creative."³⁴ Mednick, then, sees the answer "7,363,474" as being original but not creative.

As we have discussed in Chapter 3 and elsewhere, ability may not translate into behavior. Both motivation and a proper setting may be necessary if innate creative ability is to blossom into creative output.³⁵

The Creative Process

Creativity involves more than the sudden moment of inspiration in which a cartoon light bulb flashes in the brain. Instead, as shown in

34. S. A. Mednick. "The Associative Basis of the Creative Process/'
Review 69 [19fi2]: 221.

35. G. Halpin and G. Halpin, "The Effect of Motivation on Creative Thinking Ablll' &£\$," *Journal of Creative Behavior* 7 [1973]: 51-53, provide one demonstration of h i p t u of motivation on creativity.

Figure 16-8, there are a number of stages to the **creative process**. According to Graham Wallas (1926), the process includes preparation, incubation, insight, and verification.

Figure 16-8 THE CREATIVE PROCESS

Preparation Incubation Insight Verification¹

Preparation involves gathering, sorting, and integrating information and other materials to provide a solid base for a later breakthrough. The discoveries of penicillin, the benzene ring, or gravity, while each involved a moment of insight, would have been impossible without a firm grasp of related information. During the incubation stage, the mind is **not** consciously focused on the problem. The individual may be relaxed, asleep, reflective, or otherwise involved. A. E. Housman wrote that "As I went along, thinking nothing in particular. . . there would flow into my mind, with sudden and unaccountable emotion, sometimes a line or two of verse, sometimes a whole stanza at once."³⁶ The insight or "*Eureka*!" stage is the familiar, sudden moment of inspiration. Finally, verification is necessary. Here, the individual carries out the chores involved in carefully checking facts to support the insight, carrying out research to determine that the DNA molecule is in fact a double-helix or **that** a meteorite did really create a dust cloud that led to extinction of the dinosaurs.

This process, the elements of which have received research backing, further supports the contention that creativity does not just happen. It is a thorough and often painstaking activity.

Views on Creativity

There are many views on creativity. To nineteenth-century psychiatrist Cesare Lombroso [1895], creativity was a sign of mental illness associated with "signs of degeneration" such as lesions of the head, stammering, and left-handedness. Abraham Maslow (1959) took the opposite stand, seeing creativity as a characteristic of the self-actualized, healthy individual. To B. F. Skinner [1972], creativity is learned like any other behavior.

3.6. Quoted in G. A. Davis, *Creativity Is Forever* (Dubuque, IA: Kendall/Hunt Publishing Company, 1983), &

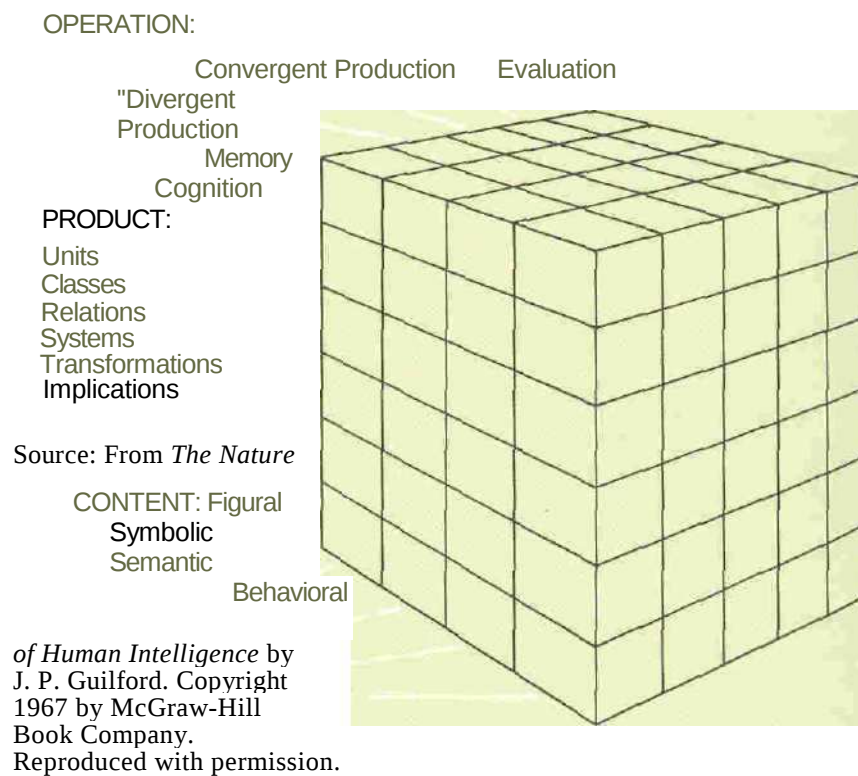
One of the more influential views of creativity has been developed by J. P. Guilford (1967). According to Guilford's structure of intellect theory, humans have 120 different and independent intellectual abilities. As shown in Figure 16-9, those abilities are each the result of application of One of five mental operations to one of four contents to get one of six products.

Operations are the things that are done with our information, such as memory or evaluation. Contents are the types of information we may have available, such as figures and symbols and words. Products are the forms taken by the processed information, such as finding relationships and drawing implications.

This model can be used to draw a distinction between creative ability and intellectual ability. Manipulation of figural and symbolic content is important to creative ability. Divergent production—the ability of the mind to expand and find new approaches—is the most important creative operation. And, transformations are valuable products of the cre-

Figure 16-9

GUILFORD'S STRUCTURE OF INTELLECT MODEL



Managerial Profile

GORDON MACKENZIE



Gordon MacKenzie flunked out of the School of Engineering at the University of British Columbia in the early 1950s. Following a few wasted years of drifting and carousing, he stumbled into the job of drawing cartoons and writing for *The Vancouver (British Columbia) Sun*. Then, after a stint with *The Toledo (Ohio) Blade* as an artist/copywriter, he moved to Hallmark Cards where, for the past 25 years, he has been struggling as an artist, writer, and design manager in the Contemporary Design Department and, more recently, as founder and manager of Hallmark's Humor Workshop. Other assignments have included creating steel animal sculptures for a children's creativity center, directing the creation of a daily comic strip and a daily panel for newspaper syndication, designing a funny fast-food joint, and directing a video film on creative recruiting. Mr. Mackenzie's present position title is Creative Paradox.

Q: What is creativity?

A: Have you ever focused your eyes' acuity on the tiny pieces of dust or lint or whatever they are that drift across the surface of your corneas? They look something like this:

J" V

Have you noticed that when you look directly at these tiny squiggles, they will move away from the center of your focus? If you try to follow them visually, they move across your eyeballs and right out of your field of vision? Then, if you stop trying to look directly at them, they'll float back into view? It is most as if the squiggles were shy.

Creativity is something like that. As soon as you try to examine creativity, the essence of it is cut out of your rational mind's "field of vision." You must be satisfied with sneaking intellectual glimpses at the creative act and accept that any definition or description of this miracle will be inadequate.

For our purposes, however, it is sufficient to think of creativity as the act of sliding from one plane of reality to another in order to discover new arrangements of matter, structure, thoughts, or ideas. As an aside, I'd like to suggest that when we use the word *new*, what we mean is *novel to our tiny slice/time within the infinity of reality*. So, when we talk of creating, we are actually talking about arranging already existing components. We are talking about synthesizing something that has already been in existence somewhere else in the universe.

We are guided by information or intelligence - that comes from outside our tiny niche within the infinite scheme. Our creative minds are not unlike radio receivers that are picking up signals from the cosmos. But this is all too mystical for the rigid thinkers among us, so we refer to this wondrous phenomenon simply as "intuition." Think of creativity as using intuition to synthesize. Q: What can a large organization do to create a climate conducive to creativity?

A: Don't expect substantial creativity to exist in the mainstream of an organization any more than you would expect something to grow in the mainstream, of a flowing river. The crux of a mainstream is the movement of something from Point A to Point B along an established path, which is usually the path of least resistance. Things do not take root in a mainstream. They are, at best, carried along; at worst, swept away. If an organization is serious about fostering creativity, it must at least allow and protect the establishment and existence of creative ecologies at the edges of the mainstream.

Creative ecology alludes to a relationship between creative environment and liberated creative people. The environment should offer the stimuli—definition of the problems to be solved, openness, trust, respect, freedom from punishment for failure or nonconformity, and freedom to play. The people should provide the creative grist—the intuitions, the fluid thinking, the honesty, the insights, and the playfulness.

Q: How does a really creative individual survive in a bureaucratic organization?

A: By being *really* creative.

ative process. Conversely, intelligence tests focus heavily on semantic content, on the operations of evaluation and convergent production (narrowing in on a solution), and on the products of systems and relations.

Characteristics of Creative Individuals

Creative persons seem to be sensitive and to prefer complexity.³⁷ They typically value independence, enjoy aesthetic expressions, have high aspiration levels, are nonauthoritarian and nondogmatic, and have a wide range of interests.³⁸ They were generally given the opportunity to act responsibly early in life.³⁹

Studies across a wide range of occupations show creative behavior to peak in the thirties or early forties.⁴⁰ This may be due to declining motivation to be creative later in life. Consistent with the arguments of the structure of intellect theory, creativity has only a weak relationship to IQ. Females outperform males on some figural and all verbal creativity tests after about age ten in our society, though different patterns appear in other societies.⁴¹ This suggests that these sex differences may be due to socialization processes.

Creative individuals resist conformity pressures if those pressures are seen as interfering with their creative accomplishments, but otherwise are willing to conform.⁴² They tend to have high turnover rates, leaving schools and jobs more frequently than those who are less creative.⁴³

CREATIVITY ENHANCEMENT TECHNIQUES

Earlier in this chapter, we discussed group processes, such as the nominal group technique and the Delphi process, which may be useful!

37- T. R. Amabile, *The Social Psychology of Creativity* (New York: Springer-Verlag, 1983)

38. F. Bartol, "The Dream of Art and Poetry," *Psychology Today* vol. 2, no. 12 (1968): 18-23; W. E. Scott, Jr., "The Creative Individual," *Academy of Management Journal* [1965]: 211-19; and G. A. Steiner, ed., *The Creative Organization* (Chicago: Univ. of Chicago Press, 1965).

39. T. Christie, "Environmental Factors in Creativity," *Journal of Creative Behavior* 4 (1970): 13-31.

40. H. C. Lehman, *Age and Achievement* (Princeton, NJ: Princeton Univ. Press, 1953).

41. E. P. Torrance and N. C. Aliotti, "Sex Differences in Levels of Performance: Test-Retest Reliability on the Torrance Tests of Creative Thinking Ability," *Creative Behavior* 1 (1969): 52-57.

42. J. R. Rhee and S. H. Osipow, "Creative Thinking Ability and Susceptibility to Persuasion," *Journal of Social Psychology* 28 (1970): 181-86.

43. P. O. Heist, "Creative Students: College Transients," in *The Creative Student: An Unmet Challenge* (San Francisco: Jossey-Bass, 1968); and E. P. Torrance, "Bias Against Job Changing Bias Against Giftedness?" *Gifted Child Quarterly* 15:119/11:3" 48.

ensuring that a large number of unique alternatives are generated. Here are some other creativity enhancement techniques. What they have in common is the recognition that good problem solving requires good alternatives.

Brainstorming

Brainstorming was invented by Alex Osborn (1963), a cofounder of the advertising agency Batten., Barton, Durstine and Osborn. Osborn described brainstorming as "Using the brain to storm a creative problem . . . commando fashion, with each stormer attacking the same objective." Brainstorming tries to create a situation in which group members feel they can come up with any ideas, no matter how strange, without fear of criticism. It has four rules:

- A *Criticism is ruled out.* This creates a climate of psychological safety, reducing inhibitions. A *Freewheeling is welcomed.* Any idea, no **matter** how wild, is sought.
- ▲ *Quantity is desired.* The more ideas, the better. A *Combination and improvement are sought* Members are encouraged to "hitch-hike" on each other's ideas, generating a chain of inspiration.

There are a number of variations on brainstorming.⁴⁴ In **stop-and-go brainstorming**, short periods of brainstorming (ten minutes or so) are interspersed with short periods of evaluation. With large groups, the **Phillips 66 technique** can be used. Once the problem is clearly understood, small groups of six brainstorm for six minutes. Then a member of each group reports either the best ideas or all ideas to the larger group. **Reverse brainstorming** brings fresh approaches by turning the problem around. How could we lower productivity? How could we decrease morale? What could be done to stifle creativity?

Group brainstorming had great popularity in the 1950s. However, enthusiasm faded in the 1960s after a series of experiments demonstrated that individuals working alone could produce more unique ideas than a brainstorming group.⁴⁵ More recently, though, it has been argued that a focus just on the number of ideas generated may be misleading. As we suggested earlier, ideas generated by a group may be more acceptable to the members. Further, by using the round-robin technique discussed in

44. These are drawn from Davis, *Creativity*.

45. D. W. Taylor, P. C. Berry, and C. H. Block, "Does Group Participation When Using Brainstorming Facilitate or Inhibit Creative Thinking?" *Administrative Science Quarterly* 3 [1958]: 23-47; and M. D. Dunnette, J. Campbell, and K. Foster, "Effect of Group Participation on Brainstorming Effectiveness for Two Industrial Samples," *Journal of Applied Psychology* 47 [1963]: 30-37.

the last chapter rather than permitting free interaction, group performance in terms of number of new ideas generated was similar to that of pooled individuals.⁴⁶

Gordon Technique

William J. J. Gordon (1961) worked with creative thinking groups and had a creative variety of other pursuits, among them salvage diver, horse handler, ambulance driver, college lecturer, and pig breeder ["...a lot of bone and not much bacon, but they were the fastest pigs in the East."].⁴⁷ He was concerned that people, when asked to come up with a creative new idea, would instead incrementalize. That is, they would take a currently available alternative and improve it bit by bit. While this might lead to marginally better alternatives, they probably would not be real breakthroughs.

Gordon decided that one way to avoid this problem would be simply not to tell people what they were inventing. So, the Gordon technique uses an initial focus on function. Rather than being told to build a better mousetrap, the group might first be told that the focus was capturing. Instead of the group being instructed to design an improved knife, tin, function could be given as severing.

Synectics

Gordon also developed a well-known technique called synectics. Synectics means joining together of apparently unrelated elements, which means this in two senses. First, an attempt is made to put very different sorts of people together in synectics groups in order to get a great diversity of perspectives. Second, synectics relies heavily on the use of analogies. Synectics techniques have been widely adopted by both businesses and educational institutions.⁴⁸ Three synectics tools are direct analogy, personal analogy, and fantasy analogy:⁴⁹

- ▲ Direct analogy. This involves looking for parallel facts, knowledge, or technology in a different domain from the one being worked on. For instance, can we think of anything similar which occurs in nature? Alexander Graham Bell's words, recalled by Gordon, illustrate this approach:

46. See R. N. Taylor, *Behavioral Decision Making* (Glenview, IL: Scott, Foresman and Company, 1984), 43-47.

47. Davis, *Creativity*, 67.

48. For instance, W. J. J. Gordon, "On Being Explicit about Creative Process," *Journal of Creative Behavior*, 6 (1972): 295-300, wrote that more than 200 businesses had spent over \$1 million on synectics techniques as early as 1971, and that materials developed by synectics education systems had influenced over 10,000 classrooms.

49. These are based on W. J. J. Gordon, *Synectics* [New York: Harper and Row, 1961].

It struck me that the bones of the human ear were *very* massive, indeed, as compared with the delicate thin membrane that operated them, and the thought occurred that if a membrane so delicate could move bones relatively so massive, why should not a thicker and stouter piece of membrane move my piece of steel. And the telephone was conceived.⁵⁰

- A Personal analogy. With this approach, synectics group members try to identify psychologically with key parts of the problem. In one case, for example, the group was asked to design a mechanism that would run a shaft turning at 400 to 4000 rpm so that the power take-off end of the shaft would turn at a constant 400 rpm. To address this question, members of the group metaphorically entered the box and tried to use their bodies to attain the required speed without undue friction.
- A Fantasy analogy. Sigmund Freud saw creativity as the fulfillment of a wish or fantasy. Fantasy analogy asks, How in my wildest dreams can I make this happen? Gordon gives the example of a synectics group which was given the task of inventing a vapor-proof closure for space suits. The ultimate solution was a spring mechanism based on the fantasy analogy of rows of trained insects clasping claws to hold shut the closure.

Idea Checklists

A number of idea checklists have been developed to enhance creativity.⁵¹ The best known of these is the "73 idea-spurring questions" devised by Osborn. This checklist can be applied to any alternative. Here are some of the questions:

- A Put to other uses? New ways to use as is? Other uses if modified?
- A Adapt? What else is like it? What other ideas does this suggest? Does past offer parallel? What could I copy? Whom could I emulate?
- A Minify? What to subtract? Smaller? Condensed? Miniature? Lower? Shorter? Lighter? Omit? Streamline? Split up: Understate?
- A Substitute? Who else instead? What else instead? Other ingredient? Other material? Other process? Other power? Other place? Other approach? Other tone of voice?
- A Rearrange? Interchange components? Other pattern? Other lay-

50. Gordon, *Synergetics*, 42.

51. See Davis, *Creativity*, for a fuller discussion.

out? Other sequence? Transpose cause and effect? Change pace!
Change schedule?

A Combine? How about a blend, an alloy, an assortment, an ensemble? Combine units? Combine purposes? Combine appeals? Combine ideas?

Osborn notes that use of these techniques during World War II improved thinking in war production installations, resulting in estimated savings of 6,000,000 person-hours per year. George Washington Carver asked the question, "How can peanuts be put to other uses?" and came up with over 300 applications. Fiberglass, tapered roller bearings, and freeze-dried foods are all cited by Osborn as outcomes of listing techniques.

Attribute Listing

According to the developer of attribute listing, Robert Crawford,, "Each time we take a step we do it by changing an attribute or a quality of something, or else by applying that same quality or attribute to some other thing."⁵³ There are two forms of attribute listing, attribute modifying and attribute transferring.⁵³

With attribute modifying, the main attributes of the problem object are listed. Then ways to improve each attribute are listed, for instance, the technique might be used to concentrate on ways to improve¹ the running shoe attributes of weight, stability, cushioning, and durability. Attribute transferring is similar to direct analogy in synectics. Attributes from one thing are transferred to another.

Morphological Analysis

Morphological analysis, sometimes called the checkerboard method, is an extension of attribute modifying. Specific ideas for one attribute or problem dimension are listed along one axis of a matrix. Ideas for a second attribute are listed along the other axis. If desired, a third (and attribute) can be added. The cells of the matrix then provide combinations. For instance, the axes for a vehicle might be type of energy source (e.g., steam, magnetic fields, compressed air, nuclear); medium of travel (e.g., rollers, air, water, rails); and type of vehicle (e.g., cart, chariot, sling, bed).⁵⁴

The benefit of morphological analysis is that it makes us aware of all possible combinations of the attributes. Many, of course, will prove to be

52. R. P. Crawford, "The Techniques of Creative Thinking." In G. A. Davis and J. Scott, eds., *Training Creative Thinking* (Huntington, NY: Krieger, 1978)

53. Davis, *Creativity*.

54. This example is from J. E. Arnold, "Useful Creative Techniques." In S. Parnes, ed., *M Sourcebook of Creative Thinking* (New York: Scribners, 1962), 251-68.

be of little value, but others may be worthwhile. Like other creativity enhancement techniques, morphological analysis makes us view the world from a different perspective. It has been shown to have promise in stimulating creativity for simple problems, though applications in management have not been systematically examined.⁵⁵

Retroduction

We are the slaves of our assumptions; they dictate the way we behave. Retroduction involves changing an assumption. This may serve two purposes. First, our assumptions may be wrong. Second, even if our assumptions are correct, we may gain valuable new perspectives from looking at things from a different angle. Einstein, for instance, revised Newton's assumption that space is flat to the assumption that space is curved and developed a new perspective on time and space.

One such technique says "Suppose X were Y." For instance, "Suppose secretaries were chief executives." Another technique pairs apparently distinct concepts, such as electric and food or cat and juggling, and sees what new alternatives might be suggested. Yet another asks "What if?" (for example, What if space had only two dimensions?)⁵⁶

THE CREATIVE ORGANIZATION

Along with use of specific creativity enhancement techniques, an organization may try to choose appropriate structure and processes to foster creative behavior. There is little hard empirical evidence to provide guidelines here. Instead, some writers have studied creative individuals and their desires and have drawn a picture of an organization that would seem to best suit them. One such picture, presented by George Steiner, is shown in Figure 16-10. The loose, free-flowing, adaptive nature of this organization is quite similar to the organic organization structure discussed in earlier chapters. Recall that such a structure seems appropriate in dynamic, complex, uncertain situations—exactly those requiring creativity.

55. For studies on morphological analysis, see E. P. Stratton and R. Brown, "Improving Creative Training by Training in the Production and/or Judgment of Solutions" *Journal of Educational Psychology* 61 (1970): 16-23; T. F. Warren and G. A. Davis, "Techniques for Creative Thinking: An Empirical Comparison of Three Methods," *Psychological Reports* 25 (1969): 207-14; F. Zwicky, *Morphological Astronomy* [New York: Springer-Verlag, 1957]; and _____, *Discover*. *Invention, Research through the Morphological Approach* [New York: Macmillan, 1969].

56. See B. Okno, "Retroduction: The Key to Creativity," *Journal of Creative Behavior* 11 (1977): 216, 221.

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Open channels of communication
 Encouragement of contact with outside sources
 Idea units absolved of other responsibilities
 Heterogeneous personnel policy
 investment in basic research
 Decentralized; diversified
 Risk-taking ethos
 Not run as a "tight ship"
 Separation of creative from productive functions
 Stable, secure environment

Source: Excerpted from G. A. Steiner, ed., *The Creative Organization*. Copyright © 1965 by The University of Chicago Press. Reprinted with permission.

If it is not possible to change the organization markedly, another option is to free some units from bureaucratic entanglements by setting up relatively autonomous units. For instance, consider the case of Convergent Technologies discussed in Situation 1.

SITUATION 1

Large Computer Firms Sprout Little Divisions for Good, Fast Work

About a year ago, Matt Sanders got kicked out of his office. His belongings were packed in boxes, and two new workers moved into the space at Convergent Technologies Inc., a Silicon Valley computer maker. Mr. Sanders hung around the building for a few days, borrowing desks, without a phone to call his own.

"If you get into trouble, call me," said his boss, Allen Michels. "and if you get some good news, call me too. But I ain't calling you." Mr. Michels adds: "Let me tell you, he was scared."

Mr. Sanders wasn't being fired, and he wasn't in trouble with his boss. On the contrary, he had been named leader of what Mr. Michels calls a "strike force" to build a new computer that would enable Convergent, which makes high-priced business computers, to enter the market for lower priced personal computers in just one year. The idea was to tap into the entrepreneurial forces that energize so many Silicon Valley startups by cutting Mr. Sanders loose and letting him form his own "company within a company." It's an approach that several large or maturing technology companies are turning to.

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FROM THE FIELD: Encouraging Creativity

In early 1986, we surveyed research and development executives from a variety of industries to learn what techniques or actions their firms use to encourage creativity and innovation. Of the formal techniques described in this chapter, brainstorming was reported to be used most extensively, followed by listing and synectics. Lack of financial resources and resistance to change were most often cited as barriers to innovation.

We also asked the executives, "To what extent do you think each of the following hinders or enhances creativity in organizations?" Executives rated each technique or practice on a scale of 1 to 5, with possible responses including 1 (substantially hinders), 3 (neither enhances nor hinders), and 5 (substantially enhances). Here are the results, ranked from most enhancing to most hindering:

Rank	Description	Average Rating
1	Participative leadership	
2	Goals for creativity	
	Separate units for creativity	3.8
3	Rewards for creativity	3.6
	Loosely structured organization	3.3
	Regular committee meetings	2.8
	Many deadlines	2.0
	Many rules and regulations	

These results suggest that managers see many of the topics discussed in this text—including leadership, goal setting, rewards, and organizational design—as possible tools for enhancing creativity. High levels of bureaucratic practices are seen as dampening creativity.

Similarly, when General Motors launched its Saturn project, the first new nameplate in the GM line since 1918, it wanted a clean-slate approach without unnecessary ties to past ways of designing, engineering, manufacturing, or selling the product. As a result, it set up a new organization in order to free Saturn from the inefficiencies and overstaffing of the current GM bureaucracy.⁵⁷

IMPLICATIONS FOR MANAGEMENT

Problem solving is pervasive at all levels of organizations- As a manager, you will be faced with decisions of varying magnitudes on a daily basis. Remember that problem solving is a process, not simply a

57. *The Wall Street Journal* .[January 9, 1985), 3,

choice. To be effective, it also requires proper problem definition, good alternatives, and thoughtful implementation and control.

Many personal and situational factors conspire against effective¹ problem solving. Some of these are largely outside the control of the individual manager, but the effects of others can at least be minimized. Self-awareness, training in statistics, and knowledge of the nature of biases may all serve to offset such difficulties. Attention to information needs and use of systematic procedures for alternative generation, evaluation, and choice may also be helpful.

When called on to make a decision, consider the possibility of involving others in the process (the Vroom and Yetton model, discussed in Chapter 14, should be useful here). This may improve both decision quality and acceptability and serve as a developmental experience for others. However, don't automatically select the interacting group, committee format. Other more structured group problem-solving processes may prove superior. The nominal group technique seems especially useful. And, with the proliferation of microcomputers and modems, the Delphi process can be applied more quickly and easily. If for some reasons formal process can't be used, even simple averaging of individual inputs can be helpful.

As organizations face increasingly complex, dynamic, and uncertain environments, they must shift their attention from efficiency to creativity. There are at least three approaches to increasing creativity in organizations: selection of individuals who are likely to be creative, use of creativity enhancement techniques, and design of organizations *to test* creativity.

However, while creatively behaving individuals do differ in some characteristics from others, attempts to select creative types may be self-defeating. That is, creativity thrives on diversity. Selection processes which screen out many perspectives and backgrounds stifle that diversity.

All of the creativity enhancement techniques discussed in this chapter have promise for application in organizations. Use them! Finally, remember that creativity, like any other behavior, depends on motivation and the setting as well as ability. Try to nurture a climate conducive to creativity. Find ways to reward creative accomplishment. Set goals to creativity. And, above all, be a role model for creative behavior.

KEY TERMS
AND
CONCEPTS

- | | |
|--------------------------|---------------------|
| anchoring and adjustment | brainstorming |
| attribute listing | coacting |
| attribute modifying | groups |
| attribute transferring | conservatism in |
| automated decision | information |
| conferencing [ADC] | processing |
| availability | convergent thinking |
| | creative ability |
| | creative behavior |

creative process decision	personal analogy
confirmation defensive	Phillips 66 technique
avoidance Delphi process	psychological account
direct analogy divergent	representativeness
thinking fantasy analogy	retroduction
focus effect framing	reverse brainstorming
effects Gordon technique	satisficing
heuristics	scoring approaches
hot decision situations	screening approaches
idea checklists increment	social facilitation effect
alizing morphological	social judgment analysis
analysis nominal groups	social loafing
nominal group technique	stop-and-go brainstorming
(NGT]	structure of intellect theory
	synectics
	synthetic group
	target group

REVIEW QUESTIONS

1. Why should managers be concerned with problem solving?
2. What are the stages of the problem-solving process?
3. What are some things that force managers to act on the basis of less than perfect information?
4. Cite four human cognitive limitations that interfere with effective problem solving.
5. Identify four heuristics and indicate why each results in suboptimal decisions.
6. How does decision confirmation relate to dissonance reduction?
7. Under what conditions is defensive avoidance most likely?
8. What are some benefits of using groups for problem-solving purposes?
9. What are the steps of the nominal group technique?
10. Under what conditions might a Delphi process be appropriate?
11. What is social judgment analysis?
12. Define the situational conditions which are considered in the Stumpf, Zand, and Freedman model.
13. Identify the stages of the creative process.
14. Briefly discuss four creativity enhancement techniques.
15. Describe the characteristics of the creative organization.

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CASE 16 A A Fatal Error in Judgment

At 11:38 a.m. on January 28, 1986, the space shuttle Challenger, with a crew of seven, rose from its launch pad, briefly ascended to the cheers of onlookers, and exploded in a ball of flames. The immediate result was widespread shock and disbelief. The cover of *Newsweek* shouted the nation's collective question, "What went wrong?" What went wrong, apparently, was the decision-making process.

"My God, Thiokol, when do you want me to launch? April?"

As Allen McDonald told it, that exasperated protest from NASA was the key moment. Under the gun, the managers of Morton Thiokol, Inc., overruled their engineers and signed approval for the space shuttle Challenger to blast off, sending six astronauts and a teacher to their immolation. After McDonald's testimony to the Presidential commission investigating the disaster was leaked to the press, the nature of the inquiry and the nation's view of the space program inexorably changed. Whatever

Technical problem caused the Challenger to blow up, it was clear that serious warning flags had been raised. Further, they went unheeded by middle-level officials and evidently were never communicated to the top. "It's not a design defect. There was an error in judgment," said Hank Shuey, a rocket-safety expert who has reviewed NASA data. In that case, the implication was as clear as it was disturbing: The astronauts and Christa McAuliffe didn't have to die.

Perhaps most damaging to the fabric of the public trust was the indelible image of the telephone conference call the night before the fatal launch, reconstructed by reporters. A caucus of Morton Thiokol engineers in Brigham City, Utah, concerned about the effect of abnormally low temperatures on the booster-rocket seals, produced an official recommendation: No go. "We all knew if the seals failed, the shuttle would blow up," one engineer later told National Public Radio. But NASA's solid rocket project manager, Lawrence Mulloy, argued that there wasn't enough proof that cold weather stiffens the seals; the agency's George Hardy said he was "appalled" at their insistence

that the launch wait for warmer weather. From Cape Canaveral, engineer McDonald protested, "It's so damn cold and none of us are really sure of anything." But as *The Washington Post* reconstructed it, NASA issued a blunt order; "We want a formal written recommendation" to launch. Thiokol, builder of the booster, gave in. The next morning, one Thiokol engineer shakily watched the lift-off. "I thought, Gee, it's going to be all right. It's a piece of cake. A friend turned to me and said, 'Oh, God, we made it. We made it.' Then ... the shuttle blew up. And we all knew exactly what happened."

Source: Condensed from *Newsweek*. Copyright 1986, by Newsweek, Inc. All Rights Reserved. Reprinted by Permission.

1. Would you characterize this as a "hot" or "cool" decision situation? Why?
2. What characteristics of defensive avoidance are seen in this case?
3. What sorts of policies or practices might have served to prevent the sorts of breakdowns in decision making that were evidenced?

PART 5 CASE A Japan's Autocratic Managers

An aspect of Japanese management that U.S. executives much admire is consensus, or collective rule. No need for the chairperson to force managers on the line to change direction—they chart the new course themselves. More and more, however, the Japanese admire something very different, a style they think of as decidedly American. In the absence of any Japanese phrase for the phenomenon, they call the style "one man," as in one-man show. When *Nihon Keizai Shimbun*, the country's leading business newspaper, published a list of excellent Japanese companies, first and second place went to companies run much like military dicta-

torships: Kyocera, a manufacturer of ceramics; and Fanuc, a maker of numerically controlled machinery and robots, "The world is changing quickly, and you need someone at the top who can change gears fast," says Ichiro Isoda, chairman of Sumitomo Bank. The one-man shows are most likely to be found running the most aggressive companies—pacesetters in their industries that tend to succeed overseas. After interviews with several dozen management consultants, executive recruiters, and corporate managers, *Fortune* magazine selected Japan's leading autocrats. Some are heavy-handed, some subtle, some theatrical, some

austere. All could be prototypes of a breed of Japanese competitor the world is likely to see more of.

Boss of Bosses

day after the U.S. presidential election, Ichiro Isoda, chairman of Sumitomo Bank, issued a press release telling President Reagan to get to work on the U.S. deficit problems, both budget and trade. Many Japanese executives would not make such a statement for fear of being thought presumptuous. Isoda, 71, has made a career of butting into other people's business.

Sumitomo Bank is an unusually powerful institution in Japan, for it is a key member of the Sumitomo Group, which includes such heavyweight companies as NEC Corp., the electronics giant. As major shareholder as well as lender, Sumitomo Bank has to clean up the mess when a Sumitomo company fouls up. Isoda got rid of the management of Asahi Breweries in 1982. Earlier, he replaced the top command at Mazda Motor Corp., then called Toyo Kogyo, which had been left in the dust by Toyota and Nissan. Firing Kohei Matsuda, president and grandson of the founder, was Isoda's most unpleasant job. "I had to do it," he says. "If Toyo Kogyo went under, the whole economy of Hiroshima would have been ruined." Two years later, riding in the back seat of a car in Dearborn, Michigan, Isoda sold a quarter of the automobile company to Henry Ford II.

When Isoda became president in 1977, the bank was bumbling along by consensus rule. "No one had to take responsibility for decisions," says Isoda. Loan committees, not individuals, approved dubious ventures, then failed to salvage them. Isoda approved the reorganization of the bank into six divisions and gave the head of each unlimited authority. The chairman promised he would not punish anyone for making a mistake, providing that the error was not

one of avoiding a decision. Says he, "I don't criticize wounds on the forehead, only those on the back."

Drink to Me Only

Keizo Saji, 65, chairman and president of Suntory Ltd., is Japan's most genial monarch, a Renaissance potentate who has written two books about wine, has created one of Tokyo's best art museums, and loves food, golf, painting, and lively companionship. When Saji raises his voice, it's to sing with the Kansai Philharmonic Orchestra in Osaka.

Still, no one in the Suntory court tells the Suntory king what to do. At the request of the Suntory management, a U.S. investment banker found a wine company ripe for acquisition. The purchase had been approved all the way up to and including Saji, or so the American thought. On the day the papers were to be signed, the sellers and the Suntory executives gathered and waited for Saji to appear. And waited. With no explanation, he simply refused to show up and the deal died.

More often, Saji puts executive through the ordeal of the five whys. He explains the procedure: "At a meeting someone will suggest something. I ask, 'Why?': I want more detail. He will answer, and then I ask 'Why?' I ask 'why' five times, and then stop." By that time, the subordinate is likely to feel that the examiner has taken a sample of his bone marrow.

Suntory was founded by Saji's father, and it thrived on the thirst of U.S. occupation troops. It has grown into a \$4-billion-a-year business that produces 18 blends of whiskey, six dozen wines, gin, tequila, soft drinks under brand names such as B Bora. Suntory is still owned by Saji and other family members of the family.

Saji uses the company to pursue some dilettantish fancies. An organic chemist by training, he has taken Suntory into biphenyl

caJ research. Also, he is negotiating with *Newsweek* for a license to publish a Japanese-language edition of the magazine, figuring that as many as 250,000 students and businesspersons want to know more about the U.S. than they can read in the Japanese press. Other publishers doubt it.

Without question, however, Saji's imagination attracts talent. Male college students majoring in liberal arts rated Suntory the company they'd most like to work for this year. Working for a Medici evidently has its attractions.

Mother Stalin

While a prisoner of the Russians in Manchuria at the end of World War II, Hisao Tsubouchi observed that his captors spoke warmly of dictator Joseph Stalin. "They said chat Stalin didn't exploit them and led a simple life," Tsubouchi recalls.

This view of Stalin is at best half true, but that's how Tsubouchi regards himself. He and his wife, Sumiko, are the sole owners of Kurushimadock Group, which had revenues of \$3.3 billion in 1983 from a collection of companies, including enough shipyards to make it the largest shipbuilder in Japan. They live modestly nonetheless, and Tsubouchi's staff is so skimpy that 300 line managers report directly to him every month.

His strategy is to take over distressed companies and use whatever measures he deems necessary to make them efficient. Sasebo Heavy Industries, a proud yard that once built ships for the Imperial Navy, was near bankruptcy in the mid-1970s when Tsubouchi bought 25 percent of the company for around \$5 million. (He now owns close to 50 percent.) Groups of Sasebo managers bowed their heads in contrition before the new owner and repented their profligate ways. Tsubouchi cut pay as much as 50 percent and dispatched workers he considered surplus to other Kurushimadock companies.

Tsubouchi, 70, has gained a status analogous to that of Lee Iacocca of Chrysler because of his apparent success in rescuing Sasebo. (The company delivered 19 new ships in fiscal 1984 and made a \$20-million profit on sales of \$455 million.) Tsubouchi is a popular lecturer on management; audio-cassettes of his advice—"Tips on Reconstructing a Company" and "How to Reprimand Your Subordinates"—are hot sellers... .

Rail Lord

For 500 managers of Seibu Railway Group, a new year gets off to an early start with a solemn 5 a.m. procession on New Year's Day to the grave of the boss's father. President Yoshiaki Tsutsumi, 50, is the closest thing Japan still has to a feudal lord—he is one of the largest landowners in the country. His half-brother Seiji does not require Ms employees to make the pilgrimage to the father's grave, and indeed has not made it himself in recent years.

From his father, Yoshiaki Tsutsumi inherited shares of a land development company, which in turn owns a shade under 40 percent of Seibu Railway. Seibu consists of several railway lines—one connecting suburban Chichibu to Ikebukuro in Tokyo—as well as large tracts of land that Tsutsumi's father bought from impoverished gentry after World War II. On the land, the son has built golf courses and ski resorts, a baseball stadium, and eight hotels at prime Tokyo locations, which operate under the name Prince. When Tsutsumi visits the Akasaka Prince Hotel, one elevator is reserved for his use; guests can wait. Revenues of \$1.4 billion in 1984 resulted in earnings of merely \$13 million.

Tsutsumi seems to regard those who work on the land as serfs. He demotes people readily. He has made it clear how he regards subordinates. "Managers are really laborers," he says. "They aren't owners. So they

should be having meals at the company cafeteria rather than in special executive dining rooms." Managers are also required to take turns performing "service duties" such as spending the night on guard at his father's grave.

He is nonetheless a conscientious executive who sometimes monitors the railroad by riding alongside a locomotive engineer and stopping to inspect stations for cleanliness. "Yes, I complain," he says. "My business is to complain...."

Bard of the Ginza

Seiji Tsutsumi, 57, is the aesthete among Japan's autocrats. In one life, he is an artist and published poet and has pals like sculptor Isamu Noguchi and novelist Kobo Abe. In another life, he is a master merchandiser. He is a major stockholder of the Seibu Group of Retail Enterprises, which includes a cluster of glamorous emporiums that had sales of \$1.9 billion in fiscal 1984. He is also president of a public company, Seiyu Ltd., a chain of stores modeled after Sears Roebuck that reported sales of \$3.6 billion in fiscal 1984 but earnings of only \$15 million.

When his father died in 1964, Serji got only a debt-encumbered department store over the railway terminal at Ikebukuro. "It was a rough neighborhood with hordes of gangsters," recalls Tsutsumi. "We had to beg wholesalers to supply us." Tsutsumi's solution was to go even deeper in debt and open stores elsewhere in Tokyo. The expansion succeeded, and his luck turned in Ikebukuro as Tokyo grew up around the neighborhood and it became an important transportation hub. The company claims that the Ikebukuro outlet is the world's largest department store, selling \$1 billion of merchandise a year.

Tsutsumi pays big salaries to recruit established talent and keeps hounding the hirelings to create. He supervises every detail. "When I designed uniforms for some store clerks," says fashion designer Issey

Miyake, "he came to the first meeting and gave his opinion. And he came to the test-one. He made the choice." Those who don't live up to expectations aren't fired. Tsutsumi simply ignores them, and they generally quit in shame.

Tsutsumi's chic new Seibu store in the Ginza is the talk of the town for many. But it is already part of the past for Tsutsumi. His mind is whirling up plans for his new credit card business and ventures into insurance, cable television, and perhaps even banking. . . .

Mr. Hurry-Up

So concerned is Takami Takahashi with the importance of time, that when he crosses his office to fetch a document he sprints. Nor does he have patience with those who don't appreciate the exquisite-value of a second the way he does. He is dismayed that a top officer of a U.S. ball bearing company doesn't know how long it takes to grind a bearing. (Answer: four to five, seconds for a ball bearing 15 millimeters in diameter.) American managers don't pay enough attention to such details, Takahashi maintains: "They waste too much time in meetings, meetings, meetings."

Takahashi, 56, is president of Minebea Co., the world's largest manufacturer of miniature ball bearings and also a maker of measuring devices, motors, and personal computer keyboards. He is in such a rush to grow that Minebea has bought seven companies in the past five years, unorthodox in a country where takeovers are snl. unusual. At the moment, Takahashi is oiling more than Si 00 million for the stock of¹ New Hampshire Ball Bearing, one of tk dozen largest U.S. companies in the business.

Mr. Hurry-Up, as one supplier edit him, sometimes flies machinery from fapan to manufacturing plants in Singapore am! Thailand rather than wait for a boat. Expensive, but Takahashi's swiftness has enable-i

the company to keep up with the demand for videocassette recorders and personal computers. Sales rose to \$557 million in fiscal 1984. Profits were \$20 million ____

Takahashi doesn't care to fraternize with other Japanese executives at Ginza parties or on the golf links. He allows himself the luxuries of an elegant townhouse in Tokyo and a baronial home northwest of the city. On the job he lives without frills. "I cut, cut, cut," he says, threatening an inexpensive table in his humble office with karate chops. Some colleagues think that by his refusal to listen to advice, he has also cut adrift talented managers and engineers. . . .

Source: Abridged and adapted from Lee Smith, "Japan's Autocratic Managers," *Fortune* January 7, 1985, 56-65. © 1985 Time Inc. All rights reserved.

- I. Use at least two of the models presented in Chapter 14 to assess when the sorts of leader behaviors discussed in this case would be most effective and when they would be least effective.
2. Discuss some potential consequences in this country of "the ordeal of the five whys." Of not criticizing "wounds on the forehead, only those on the back." Do you think there would be much demand here for a tape titled "How to Reprimand Your Subordinates"? Explain your views.
3. What can be inferred about norms of Japanese workers from the material presented in this case? About the role of status in Japan?:
4. What motivational techniques are evidenced in this case? What do you think would be the probable consequences of use of those techniques in the United States? Why?
5. From the point of view of problem solving, what are some potential benefits of the behaviors noted in this case? What are some likely consequences for creativity?

