In response to these problems with optimizing methods, theorists proposed alternative decision-making models. Some of the models predict that people choose the first satisfactory option that comes into their minds. These are "satisficing" approaches. Other methods compromise between "optimizing" and "satisficing." It is most likely true that people can both "optimize" and "satisfice." Some theorists claim that the style of decision making people follow depends on the amount of stress that they feel. Stress causes people to become aroused. Research has discovered that decision makers are at their best under intermediate amounts of arousal. Too little arousal, and people are not vigilant enough. Too much stress, and they panic.

Janis has proposed that cohesive groups can suffer from a problem he called "groupthink." Groupthink is a condition that occurs when groups under stress establish the norm that displaying consensus is the group's number one priority. The hypothesis of groupthink is too vague to undergo experimental analysis. Nevertheless, groupthink is valid as a useful concept. Certain historical events, in which groupthink seems to have occurred, support it.

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FORMAL PROCEDURES FOR GROUP DECISION MAKING

THIS CHAPTER WILL DISCUSS:

1. Procedures groups can use to conduct their discussions.
2. The circumstances under which each procedure is most effective.
3. How research has examined these procedures.
4. Computerized versions of these procedures.

INTRODUCTION

As we discussed earlier, it is difficult to judge the performance of a decision-making group. For example, is a new company policy the best one that the group in charge could have created? We have no standard we can use to judge the policy. Instead, the most objective method we can use to evaluate a decision-making group is to look at the *procedure*, or method, the group uses. We have discussed this idea several times in this book. For instance, does the group take into account as many ideas as it can? Does it strive to evaluate these ideas as thoroughly as possible?

Hence, scientists have concentrated on the procedures that decision-making groups use. Even further, researchers have used their observations to make recommendations. They have proposed various formal decision-making procedures that groups can follow. Poole (1990, p. 55) defined these formal procedures as "sets of rules or guidelines which specify how a group

should organize its process to achieve a particular goal."

These sets of rules, or guidelines, are the topic of this chapter, and we will be describing a number of them. Before we begin our discussion, we would like to highlight some general ideas about formal procedures.

ADVANTAGES OF FORMAL PROCEDURES

Behind the general ideas that we will examine is a unifying concept that formal procedures are helpful. Scientists believe that procedures improve the decision-making performance of groups. In an essay on the topic, Poole (1990) listed a number of reasons for this. All are based on the presumption that natural group discussion, or "free" discussion, is susceptible to serious problems. The purpose of formal procedures is to try to protect groups from these problems. The goal is to help groups avoid difficulties yet still let them take advantage of the strengths of group decision making. We discussed these strengths in Chapter 2.

Poole's Summary

We will describe Poole's eight reasons. Each explains why formal procedures can help groups improve their decisions.

Reason 1

First, scientists purposefully design formal procedures so that they are very different from free discussion. This helps groups avoid the dangers of complacency.

Free discussion can be safe and routine because it is the way groups usually make decisions. It follows, then, that formal procedures lead to "unnatural" discussions because groups do not usually use them. "Unnatural" discussions can be uncomfortable and difficult for group members. People who advocate formal procedures see this as a strength. They believe procedures can get group members out of ruts and sloppy habits of thinking. Being forced to act "unnaturally" can make members think more clearly and creatively than they normally do.

Reason 2

Second, formal procedures increase the likelihood that group members think about the same thing at the same time.

In free discussions, coordinating activities may be a problem. One member may be trying to analyze a problem, while a second is proposing a solution, and a third is trying to evaluate earlier proposals. Formal methods, on the other hand, tell members what they should be thinking about at stages of the discussion. This is advantageous because it increases the likelihood that group members stay on the same wavelength.

Reason 3

Third, formal procedures make it difficult for a few talkative members to dominate a group's discussion.

In free discussions one or two people tend to talk a disproportionately large amount of time. This tendency increases as group size increases. The less talkative members get shut out, and the group never hears their ideas. Certain formal procedures, however, can control how much members speak and in which order. These procedures can help ensure that all members have the opportunity to present their ideas. In addition, they make it less likely that a few people can dominate a group's discussion.

Reason 4

Fourth, formal procedures help curb powerful group members.

Powerful members can easily exploit free discussion and use it for their own purposes. This does not happen as easily under the guidelines of formal procedures. Guidelines make it more difficult for powerful members to control what happens during a meeting.

For example, in free discussion a powerful person could set the group rules for what members can and cannot discuss. With a formal procedure, however, the procedure itself determines the group rules. The whims of a powerful member do not have control.

Further, members can reinforce ground rules easier if the group is following a set procedure. Suppose that a group is trying to follow a formal procedure faithfully. Frank makes an inappropriate statement. Dan tries to enforce the procedure and says that Frank's comment was out of line. Frank will know that Dan is using the procedure's group rules as a basis for his judgment and not his own prejudices. Frank is therefore much more likely to accept Dan's judgment.

Reason 5

Fifth, formal procedures help groups deal successfully with conflict.

Without formal group rules, some groups may try to smooth over or ignore conflict. Still other groups may become embroiled in destructive conflict. This destructive conflict can come from power struggles or personality conflicts that have little to do with the substantive issues facing the group.

Procedures help groups deal with conflict in two ways. They force groups to face up to conflict, and they lay out rules as to when and how members can discuss disagreements. As a result, procedures increase the likelihood that groups will manage conflict successfully.

Reason 6

Sixth, formal procedures help give a sense of direction to meetings.

When members have a free discussion, they often feel that their meeting

is getting nowhere or going around in circles. This can lead to great frustration. Consequently, members may come to a premature decision because they want to end the discussion quickly.

In contrast, under formal methods groups know at all times where they are in a discussion. They know how far along the decision process they have come and how far they have to go. Each step that members complete helps give them a feeling of accomplishment and progress. This makes it less likely that they will become frustrated and less likely that they will make their decision prematurely. Instead, their decision should be better because they take the time they need.

Reason 7

Seventh, formal methods give groups a basis for judging how well they are proceeding.

With free discussion group members often have no way to judge whether their group is handling its discussion well. Under formal guidelines, however, members can more easily determine whether the group is doing what it ought to be doing.

In addition, a procedure makes it more likely that members will evaluate themselves and examine whether they are doing a good job. The group as a whole can use the procedure as a basis for their evaluation. It can help them discuss and evaluate their discussion. This kind of reflection and self-examination is likely to help the group's future performance.

Reason 8

Eighth, a procedure can empower the group members.

Formal guidelines can give members the feeling that they are in control of their destiny as a group. This happens when members know they have followed a procedure well, managed conflict successfully, given all members an equal opportunity to participate, and as a result have made a good decision. Further, this feeling of control is not false if the members have indeed made a good decision after following the steps of a procedure. They truly are in greater control of their destiny than a free discussion group. A free group discussion allows the whims and prejudices of powerful members to control the decision-making process.

Advantages Can Be Problematic for Some

Given all these advantages, why do groups not jump at the opportunity to use procedures? Poole argued that the answer lies in the advantages themselves. His reasons are not attractive to everybody, and indeed are often the reasons groups are less likely to adopt formal procedures.

Why would this be so? Let us go through some advantages and see how

they might cause problems for some group members. The first advantage we noted was that procedures are "unnatural" and require effort. This may discourage less dedicated group members from wanting to try them. Another advantage that would be unattractive to some members is the way that procedures can restrict personal power. Members who wish to use group discussion to advance their pet proposals or personal status will fight any effort to use a procedure that will lessen their power. Similarly, members who just want to talk a lot will feel constrained by procedures that control their talk time. Finally, a procedure that makes conflict more open will threaten members who fear conflict.

Recommendations for Using Procedures

Further, groups are wary of formal procedures for other reasons. A procedure is no panacea for group problems. A formal method will scarcely help group members who lack the skills or motivation to think creatively and critically. Additionally, problems can develop if a group trusts one member to lead it through a method and follows that member blindly. The leader could exploit the procedure for personal benefit as easily as someone could exploit a free discussion.

Thus, if a group is going to use a procedure, Poole recommended the following:

1. Train as many members as possible in the procedure.
2. Follow the original design of the procedure. Do not allow members to pressure the group into changing the procedure in a way that would damage its effectiveness. If members want to adapt a procedure, they should do so carefully. They should have knowledge about what they are doing and think about all implications of the changes.
3. If the discussion is particularly "touchy," a neutral facilitator should lead the group through the procedure. This does not absolve the members themselves, however, from learning and understanding the procedure.
4. Evaluate the group's performance after the decision is made. The members then should adopt any improvements that they will need for the next time they make a decision.

Researchers have created various formal group procedures. Some consist of extremely detailed rules; others are little more than general guidelines. Before we move on to the extremely detailed procedures, we will review some of the more general ideas.

GENERAL FORMAL PROCEDURES

Consensus Rules

Hall and Watson (1970) proposed six rules to help groups reach a mutually satisfying consensus. As we have discussed throughout this book, a consen-

sus exists when all group members accept a proposal. The rules that Hall and Watson developed are:

1. Members should avoid arguing for their "pet" proposals.
2. Groups should avoid "us against them" stalemates in which each side in a dispute must either "win" or "lose."
3. Members should not comply with a group majority if they do so only to avoid conflict.
4. Groups should not use rules for decision-making that allow them to avoid conflict, such as a "majority wins" rule.
5. Groups should view differences of opinion among members as natural and helpful.
6. Members should consider that their early, initial agreements are suspect and premature.

Methods to Avoid Premature Decisions

Groups can make decisions prematurely if members do not examine their options sufficiently. General procedures have been proposed to help group members avoid premature decisions. We shall focus on two of these procedures: "devil's advocacy" and "dialectical inquiry." Both are similar to the methods that President Kennedy used to keep groupthink out of his group during the Cuban Missile Crisis (see Chapter 12).

Similarities

These procedures are similar. They are both based on the idea that faulty assumptions can cause problems for groups. The hypothesis is that one reason that groups often make premature decisions is that their members unwittingly accept the same basic assumptions about their group situation.

For example, an environmental organization is planning its activities for the next year. It must estimate how much money it will have available for activities. Members may all have assumptions about the money that the group can raise, and the organization may accept an estimate without questioning it. In the end, the group could come to a decision that leads it into financial difficulties.

Hence, the goal of both procedures is to help members examine their assumptions.

Another similarity between "devil's advocacy" and "dialectical inquiry" involves the way groups should begin their discussions. In both procedures, the decision-making group splits into two subgroups. One subgroup comes up with a preliminary decision. The members of this subgroup also list the assumptions they used to form their decision.

Differences

Beyond these similarities, the two procedures start to differ.

In *devil's advocacy*, the second subgroup prepares a criticism of the preliminary decision and the assumptions behind it. For example, half the planning group in the environmental organization decides on a list of activities. They also estimate the amount of money the organization can raise to pay for activities. The other half proceeds to criticize this preliminary decision. It may reject the decision on the grounds that the assumptions about the money available are too high. The first subgroup then proposes a second preliminary decision in response to the criticisms from the devil's advocacy group. A second list of assumptions is behind this new proposal. What happens next? The second subgroup again criticizes this new decision and the assumptions behind it. Hence, the devil's advocacy procedure sets up a cycle in which groups go back and forth between proposals and criticisms. This cycle continues until the first subgroup comes up with a decision that the second subgroup can accept.

In *dialectical inquiry*, the second subgroup does not merely criticize the first subgroup's preliminary decision and assumptions but proposes an alternative, based on a different set of assumptions. In the environmental organization, the second subgroup believes that the first group has assumed a level of available income that is too high. Therefore, the second subgroup proposes fewer planned activities. The two subgroups then come together to compare ideas. They look at the feasibility of both proposals and at the accuracy of each one's underlying assumptions. This discussion continues until the entire group reaches a consensus. They must agree on the most valid set of assumptions. Based on those assumptions, they make a final decision (see Mason, 1969, for a description of both devil's advocacy and dialectical inquiry).

General Methods vs. Detailed Procedures

We have discussed several general procedures, such as the consensus rules that Hall and Watson created and the devil's advocacy and dialectical inquiry methods. These general methods can be valuable aids to group decision making. None of them, however, details a procedure that groups should use to govern their actual decision-making process. The procedures that we will examine next attempt to provide such details.

EXPLANATION OF DETAILED FORMAL PROCEDURES

"Linear" Models

All the methods we will examine are *linear* models. In other words, the models assume that a sequence of stages is important in any decision-making

task. The idea is that groups perform best when they divide discussion into a small number of distinct stages. The stages may be, for example, "idea generation," "idea evaluation," and "choice of the best idea." The group should perform each stage in sequential order and never go back to a previous stage once the group has moved on to the next stage in the discussion.

Differences

In general, the procedures we will examine differ in two ways. First, theorists make slightly different claims about the degree to which groups should allow members to speak freely. Most models prefer comcon networks, in which all members can talk to one another freely. Some methods, however, lean toward wheel-like structures, in which communication flows through a central member.

Second, and more important, the procedures assume different views of group members' decision-making capabilities. As we discussed in the last chapter, various theories concern how capable people are when it comes to making decisions. Some of the models we are about to examine assume that people have the ability to optimize totally. Others claim that people are able to use only the grossest satisficing methods. In between these two extremes are some models that compromise between optimizing and satisficing. If you are ever in the position of planning a group decision-making meeting, you should remember these factors as you choose the procedure the group will use. You need to consider your beliefs about the decision-making abilities of the people who will be responsible for the group's verdict.

Our Examination

We will now examine some detailed procedures. Each procedure will have its own section. We are going to make some suggestions concerning the proper circumstances for using each of the procedures that we will discuss. At this time, except for one case, our recommendations will be based on the logical implications of the models and not on experimental evidence. Later in this chapter, we will discuss research concerning these procedures.

Let us begin our discussion. For our purposes, we will focus on one decision-making task. Let us see how each procedure works when a group must decide on a menu for dinner. We shall call our group the "Diner's Club."

BRAINSTORMING

Brainstorming is a technique to help groups generate proposals for alternative courses of action. It was not intended as a method for carrying out the entire decision-making process. Osborn (1957) proposed the idea of brainstorming. He believed it was a way to help people make more creative proposals than they otherwise could have.

As you recall, we distinguished in Chapter 2 between theorists who are wholists and those who are reductionists. Wholists believe that people perform tasks better when they are members of a group than when they are alone. In contrast, reductionists believe that people perform tasks better when they work alone than when they are in groups. Osborn was a firm believer in wholism. He believed that people working in groups have the potential to generate more ideas and more creative ideas than when they work alone.

Osborn also believed, however, that people often do not realize this potential because individuals working in groups are often afraid that other group members will evaluate their ideas negatively. People are particularly afraid that the group will dislike their "craziest" notions. Therefore, group members often are afraid to express their ideas in public. This is a significant drawback because "crazy" ideas are sometimes the most creative and best solutions to problems. Hence, Osborn wanted to provide a technique for generating ideas in groups that would make people comfortable enough to express even their most "off-the-wall" ideas. To do this, he created the brainstorming method.

Brainstorming is easy. The first step is to choose a person to write down all the proposals that the group generates. Next, the members call out their ideas. They do so under unique conditions:

1. Under no circumstances can members evaluate any proposal. Encouragement is fine, but the group does no evaluating until a later stage. Osborn believed that people are apprehensive about suggesting their ideas because they are afraid that others will evaluate these ideas negatively. Therefore, if the group follows the rule that members cannot evaluate proposals, people should feel free to express any ideas that they have. Brainstorming will not work unless the group strictly follows this first rule. If any member begins to evaluate a proposal, the group must enforce the rule by gently reminding the group *as a whole* not to evaluate ideas.
2. The members should attempt to generate as many proposals as they can. A large quantity of options should ensure that at least a few of them will be good.
3. Participants should "freewheel," that is, attempt to come up with the wildest proposals they can imagine. Most of these ideas will no doubt be bad, but one of them may instead turn out to be a stroke of genius.
4. Members should "piggyback," that is, generate ideas that build on suggestions of other group members.

Example

The Diner's Club brainstorms about dinner suggestions, following the conditions set forth above. They arrange their ideas in columns and find that they have the following list:

Hamburgers	Salad	Lasagne
French fries	Soup	Lo mein
Steak	Spaghetti	Chow mein
Pork chops	Spaghetti and meat balls	Tacos
Lamb chops	Spaghetti and meat sauce	Tortillas

As you can see, the Diner's Club has a wide range of ideas for dinner. Did brainstorming help the group? If so, how much? The effectiveness of the brainstorming technique is variously regarded.

Effectiveness of Brainstorming

Brainstorming is most appropriate when the group's task is specific and fairly limited in range. Under these conditions, the technique will lead to proposals that are most likely to be feasible and least likely to be so numerous that they overwhelm the group.

A disadvantage of brainstorming is that the sheer number of options can force a group to spend a great deal of time evaluating possible courses of action. Further, members express many potentially good ideas in a vague form as they brainstorm. Consequently, the group needs a great deal of time to formulate more precise versions of these options to evaluate them properly.

Brainstorming Experiments

Scientists have conducted many experiments in an attempt to discover whether or not brainstorming actually does what Osborn intended. In Chapter 2 we described the work of problem-solving groups. As you recall, the best way to study problem-solving groups is to compare them with "nominal groups" of the same number of people working alone. In this way, researchers can compare the quality and quantity of ideas coming from groups and from same-size aggregates. This is also the best technique for studying brainstorming.

Lamm and Trommsdorff Review

Lamm and Trommsdorff (1972) reviewed a number of brainstorming studies. Their findings are not encouraging. In one part of their review, Lamm and Trommsdorff looked at 12 experiments. In 9 of the 12, nominal groups generated more nonduplicative ideas than actual brainstorming groups. The remaining 3 found no difference between aggregates and brainstorming groups. Lamm and Trommsdorff also reviewed 8 studies that looked at the quality of ideas generated. Six of these found that nominal groups generated ideas that were, overall, superior to those of brainstorming groups. Several possible reasons for these findings have been suggested:

1. Members may continue to fear criticism and, therefore, withhold proposals, even though the conditions of brainstorming forbid criticism.

2. Brainstorming groups may spend too much time in task-irrelevant talk.
3. People in the groups may become overaroused, causing them not to be at their psychological best for creative work.
4. Listening to one another may distract members from thinking about new proposals.
5. Dominant and talkative participants might monopolize the brainstorming discussion, preventing other members from making their suggestions.
6. As they do with additive tasks, members of brainstorming groups may engage in "social loafing" (see Chapter 2).
7. The experimental results may be due to the amount of time that the groups were allotted. The brainstorming and nominal groups had different allotted times in which to generate proposals. Imagine that an experimenter placed a 12-minute limit on the time that the participants could use to create ideas. In the brainstorming groups, each group of four members had a total of only 12 minutes to generate a list of options. In contrast, the same number of people working in different rooms had a total of 48 minutes (12 for each person) to generate their lists. Thus, brainstorming groups may be potentially as effective as nominal groups. It just might be that they need more time to fulfill that potential.

Philipsen, Mulac, and Dietrich Study

A study by Philipsen, Mulac, and Dietrich (1979) supported the last possibility. Participants performed two brainstorming tasks, which were each separated into two stages. In the preliminary stage of the first task, group members worked together for 12 minutes and made verbal proposals for solving a problem. During the second stage of this task, the members separated. They then individually wrote ideas, in response to the same problem, for 12 minutes.

For the second task, participants worked alone the entire time. During the first stage of this task, participants took 12 minutes to make individual verbal proposals for solving a problem. In the second stage, they individually wrote ideas, for the same problem, for 12 minutes.

The researchers looked at the first stage of each task and compared the participants' performance. They found, as expected, that nominal groups verbalized more nonduplicative proposals than brainstorming groups during this stage. The aggregates averaged 41 ideas; the brainstorming groups averaged only 23.

The experimenters then compared the second stage of each task. Members of nominal and brainstorming groups wrote down the same number of proposals, an average of 35. The researchers also judged that the quality of the ideas was similar. These findings suggest that members of brainstorming groups may have the potential to generate as many, and as good, ideas as people in nominal groups. It may just be that brainstorming groups need

more time. If they have enough time to work on problems, they could perhaps achieve their potential.

General Conclusions

Nevertheless, the advantages of nominal groups over brainstorming ones are real. Nominal groups tend to generate ideas higher in quality and quantity than brainstorming groups, given normal time limits on the process of idea generation. This does not necessarily imply that people should always generate proposals when they are alone instead of when they are in groups. For example, brainstorming is fun. The maintenance advantages it provides groups may outweigh the loss of quality and quantity of ideas. Another consideration is that the experience of brainstorming may improve the ability of group members to work together during the subsequent stages of decision making (Philipsen et al., 1979).

Thus, the group experience of generating ideas together still may be worthwhile, despite the experimental findings. Further, if group members do generate ideas together, brainstorming may be a good method for doing it. Lamm and Trommsdorff also report evidence that brainstorming groups produce more and better ideas than groups that have no procedure for generating proposals.

THE NOMINAL GROUP TECHNIQUE

In this section we will describe the procedure called the *Nominal Group Technique*, or *NGT*, proposed by Delbecq, Van de Ven, and Gustafson (1975). This procedure is a complete method for decision making, moving from idea generation to the final decision. It also provides a procedure for generating ideas, which has both advantages and disadvantages in comparison with the brainstorming technique.

Description

So far in this book, we have used the term "nominal groups" to denote groups that do not actually meet. Instead, several individuals work alone to create the products of nominal groups. NGT maintains that members of a nominal group *do* meet. The technique, however, discourages interaction among group participants. Members interact directly with an assigned group leader instead of with one another. Thus, the model attempts to establish a wheel network. We should not overemphasize the analogy between NGT and the wheel structure, however. Members in a group using NGT do see one another and hear one another's messages. Hence, the group structure is not exactly a wheel.

NGT consists of the following six-step procedure:

Step 1—Silent Generation of Ideas. The leader first presents the group with the issue that it needs to resolve. For example, the leader of the Diner's Club might ask, "What should we cook for dinner?" Next, the leader and the other group members work individually, silently writing a list of alternative courses of action. They have a predetermined amount of time in which to do this. For instance, the leader of the Diner's Club could give the group five minutes to write ideas. If someone disrupts this silent, independent activity, the leader should speak to the group as a whole rather than to the guilty person. For instance, the leader might say to the group, "Please, we should be working alone right now."

Step 2—Round-Robin Recording of Ideas. Under direction of the leader, the members take turns speaking. One at a time, the leader and all members each present one proposal to the group. The leader writes down the ideas, in the form of short phrases, on a sheet of paper, chalkboard, or similar medium and places the list so that it is clearly within each member's sight. The leader should try to phrase a member's proposal in the same wording that the member used. Alternatively, the leader can ask for the member's approval if any paraphrasing of the idea is necessary. Participants continue taking turns and offering one proposal at a time until no new ideas are forthcoming. Members should not restrict themselves by saying only the alternatives that they have written on their personal lists. They should voice any further ideas that come into their minds during this period. As in brainstorming, the participants should piggyback on the ideas of one another. If a person has no new proposals when his or her turn comes around, the person should say "Pass" and give the floor to the next member. People who pass may reenter when their turn comes again if they think of new ideas. If all members pass on any round, the leader should declare that Step 2 is over.

Step 3—Serial Discussion for Clarification. Starting at the top of the list, the leader covers each proposal in turn. He or she leads a group discussion to ensure a common understanding of each alternative. As the leader comes to each new item on the list, the member responsible for the idea can take the major role in the discussion. The group should, however, encourage all members to express their thoughts about the meanings and implications of all ideas. The rules for this discussion include keeping evaluation to a minimum and not allowing arguments about the ideas. The leader is responsible for enforcing these rules. Again, if someone breaks a rule, the leader should criticize the group as a whole rather than the guilty person.

Step 4—Preliminary Vote on Item Importance. The intention of this step is to shorten the list of alternatives. The group does this by eliminating proposals that have little support among group members. To do so, participants work silently. They rate each idea and write down their ratings on a piece of paper. The members use a predetermined method to rank each alternative. One method is for each person to choose five favorite ideas and rank-order them with number one being the favorite. Ideas that do not fall into these top five do not receive a ranking. If the Diner's Club used this method of ranking, the members' lists might look like Table 13.1.

TABLE 13.1

	Group Members			
Proposal	A	B	C	D
Steak	1	3		4
Spaghetti and meat sauce	3	1		2
Salad			1	
Chow mein		4	2	3
Hamburgers	2			5
Tacos		2	5	1
Hot dogs	5			
Sandwiches		5	4	
Pork chops	4		3	

After members complete their rankings, they hand in their sheets of paper to the leader. The leader should shuffle the papers to maintain member anonymity. He or she then tallies the rankings for each proposal on the chalkboard, large paper, or whatever else he or she is using to display the proposals. The group then looks at the rankings and eliminates the alternatives that most group members do not support. The members attempt to retain five to ten ideas that they can discuss further. In our example, the Diner's Club might retain the alternative that three members approve, such as steak, spaghetti and meat sauce, chow mein, and tacos. The group might further add salad because it was one member's favorite choice.

An alternative ranking method is to have members rate each proposal on a scale from "0" to "10." "Zero" would indicate a terrible idea, and "10" would represent a great proposal. The members could then eliminate the proposals that most members feel are poor ideas.

Step 5—Discussion of the Preliminary Vote. The intention of this step is to allow members to study the remaining proposals further in preparation for a final vote. Again, the group looks at each alternative in turn. Members should raise any additional questions that they might have about the meanings and implications of the proposals. Evaluation of the ideas is again discouraged.

Step 6—Final Vote. Members once again individually evaluate the remaining proposals and write their judgments on paper. The leader again anonymously tabulates the ratings, or rankings, and writes them on the paper or chalkboard in front of the group. The idea that the group members evaluate most highly becomes the group choice.

Advantages

Looking over the steps of the model, we can see that Delbecq et al. designed the NGT to restrict the flow of communication among group members. In addition, the rules of the technique make it difficult for the group as a whole to evaluate the proposals or argue about them. Members cannot easily become aware of one another's feelings concerning the proposals. Thus, when a leader fears that free group discussion will lead to undesired conflict among members, NGT is a good technique for the group to use. In addition, the method is effective in situations in which members are strangers and may feel uncomfortable disclosing their preferences. The procedure is also effective if participants wish to keep their opinions secret.

In short, NGT depersonalizes group decision making. The method is a good defense against the effects of overly talkative or dominant members. It ensures that all participants have an equal opportunity to propose courses of action. Through the use of a paper-and-pencil rating, it also guarantees that all will have equal input for choosing the best proposal.

Further, we can best characterize NGT as a *quasi-optimizing* procedure. The technique is not a satisficing or quasi-satisficing method, in that it is likely to lead to an optimal decision. Unlike a truly optimizing model, however, NGT does not maintain that people are capable of doing many calculations at once. It does not claim that members can deal with all the information necessary for making the optimal choice at the same time. Instead, the technique has the group narrow the number of proposals to a rather manageable number in Step 4. The group then has only a few ideas left to consider during the final study stage of Step 5.

Disadvantages

The use of NGT also has several disadvantages. For one thing, it is time-consuming. For another, it is relatively boring for a group to go through the NGT stages. The technique may also suppress "off-the-wall" ideas because, unlike brainstorming, people have quite some time between when they think of ideas and when they express them. This time allows members to think about their proposals and perhaps choose not to say the most free-wheeling of them aloud. The person might feel uncomfortable letting the group inspect a somewhat strange idea.

To circumvent this potential problem, a leader may choose to omit the silent writing of ideas described in Step 1 and replace this step with a brainstorming session. This substitution can work as long as the leader feels that the members are sufficiently comfortable with one another and that none of the participants will become overly dominant.

Thus, NGT has advantages and disadvantages. Since its creation, groups have found it useful for certain situations.

Table 13.2 summarizes the steps in the Nominal Group Technique.

TABLE 13.2 Summary of steps in Nominal Group Technique.

Step 1	– Silent generation of ideas
Step 2	– Round-robin recording of ideas
Step 3	– Serial discussion for clarification
Step 4	– Preliminary vote on item importance
Step 5	– Discussion of the preliminary vote
Step 6	– Final vote

Now we shall move on to another procedure that groups have been using for several decades.

REFLECTIVE THINKING

The *Reflective Thinking* procedure is an attempt to provide groups with an optimizing decision-making method. It is based on the work of the philosopher John Dewey (1910). Dewey proposed that people generally follow a series of steps when they think "reflectively." He believed that people make "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends" (p. 6).

Dewey's Hypothesis

In Dewey's view, a reflective thinker goes through the following stages when considering a problem:

1. The person feels that a "difficulty" or problem exists in the present situation or course of action. This problem exists due to any of the following causes:
   a. The situation and a desired goal are different. For example, the person wishes to reach a town but is lost.
   b. An inconsistency exists among known facts and/or beliefs. For instance, the person reaches a town that he or she thought was the destination, but the town has a different name than the person thought it would.
   c. An inconsistency exists between events as they have occurred and the expectation of how they should occur. These expectations are based on rules or laws. The person thought that walking westward would lead him or her to the town, for instance, but instead the person became lost.
2. The person locates and defines the difficulty as precisely as possible and looks for the causes of the problem. This step requires that the reflective thinker use "suspended judgment." This means making an active attempt *not* to accept the most available cause or explanation for the difficulty without additional reflection. In more modern terminology, the person must make an effort not to use a simplified heuristic when making a judgment. For instance, why does the town have a different name than the person expected? The most available explanation might be that the person is lost. He or she should not simply accept this, however. Is it perhaps the same town with a different name? Is the town the person wants simply very close by? Further questions can follow.
3. The person forms an image of the ideal solution to the difficulty. This image includes the characteristics of the ideal solution and what the ideal solution would accomplish. In our example, the ideal solution would succeed in getting her or him to the town being sought.
4. The reflective thinker proposes a set of theories, hypotheses, or solutions that may solve the problem. For example, the person is in the right town, or the person needs to take a different road.
5. The person evaluates the proposals. Using the results from the third step, the person knows the requirements for an optimal solution. He or she compares the proposals with these requirements and chooses the most reasonable solution. For instance, if the person decides that he or she is lost, he or she then decides, based on evaluation, that the optimal solution to this dilemma is to take another road.
6. The reflective thinker finally makes further observations and tests to see if the choice is correct. The person asks directions and further discovers where he or she should be heading.

Description

In Chapter 12, we discussed research that suggests that people may not normally make decisions in an orderly process, such as the one that Dewey envisioned above. Nevertheless, scientists have used Dewey's proposal as the basis for a decision-making model. The model uses Dewey's ideas to suggest how people and groups *should* make decisions. As we have stated, the resulting model is the Reflective Thinking procedure. It is an optimizing method that uses a comcon communication network. As long as all group members know how to use the procedure, an assigned leader is unnecessary. If this is not the case, an assigned leader who is familiar with the technique should lead the group.

The Reflective Thinking method uses the following steps, each with its own set of questions:

Step 1—Awareness of the Difficulty

a. "What is a precise definition of the difficulty?" To answer this question, the group states the problem. For example, the Diner's Club might ask, "What should we cook for dinner?" The group then must come to an agreement about the meanings of the important terms in this statement. For instance, does the term "dinner" mean only a meal that people eat late in the day? Does it also imply that the meal is large?

b. "What are the symptoms of the difficulty? How has the problem manifested itself? Whom does it hurt, and how does it hurt them? Under what conditions does it harm them?" In the case of the Diner's Club, the symptom is hunger. It affects the members of the group by making them uncomfortable.

c. "How big is the problem? Is it getting worse?" For the members of the Diner's Club, it is late in the day, and the symptom of hunger is getting worse.

d. "What are the implications of the difficulty in the future?" The members might answer, "If we do not eat, we will eventually become weak and irritable."

e. "What is being done at present to meet the problem? In what ways are these efforts ineffective?" In the case of the Diner's Club, nothing is being done. No one is making dinner.

Step 2—Analysis of the Problem

a. "What causes led to the present difficulty? What conditions exist in the situation that allow the causes to act as they do?" For the Diner's Club, the problem is that they have nothing planned for dinner. This difficulty occurred because they did not think about it earlier. Conditions kept them from thinking about dinner. They were working hard on an important project of planning a group trip to a gourmet festival, and they were not yet hungry. Hence, when they got together to plan their club's dinner, it was already late. A fundamental cause for the members' difficulty is that people must eat to live, and the club is now together in order to eat.

b. "Which causes are major and which are secondary?" The major reason for the difficulty is that the club members failed to think about it. Their not being hungry earlier should not have kept them from thinking about it, and thus this cause is actually minor. Indeed, the members are now hungry; so the cause has become irrelevant to the present situation.

c. "What direction should our approach take?" The group must make a decision concerning which aspect of the problem the best course of action should address. Should it deal directly with the fundamental cause? Should it instead focus on the less important causes or on the symptoms? Ideally, people wish to deal with the fundamental cause of a difficulty, which is often impractical. In the case of the Diner's Club, members must accept that people must eat to live. They can then deal with the problem of deciding what to eat.

d. "Which requirements must a satisfactory solution meet?" This is perhaps the most difficult part of the Reflective Thinking procedure; yet it is an extremely important step if the group wants to perform the procedure well. Here, the group generates a list of criteria that an optimal proposal must meet. Scientists who advocate the Reflective Thinking procedure have not taken a stand regarding how the group should generate this list of solutions. Perhaps an abbreviated NGT procedure would suffice. Members could follow steps 1 through 4 of NGT, for example. In general, some criteria that would concern the group would be the extent to which the proposal would eliminate the difficulty and its symptoms and the extent to which the course of action is feasible in terms of time, person-power, expense, and material. In the case of the Diner's Club, the group decides that tonight's dinner must meet the criteria of (1) taking less than an hour to cook, (2) being relatively easy to prepare, (3) requiring foods that are on hand in a condition that the members can use (for example, the food cannot be frozen), and (4) being plentiful enough to feed the entire group.

e. "Must a course of action observe any 'boundaries'?" By "boundaries," we mean capability and feasibility values. The existence of boundaries might suggest the need for additional criteria for an optimal proposal. For example, cooking a steak might be sufficient for solving the difficulty, and it is feasible as well. If the group includes some vegetarians, however, a steak would present a problem. It would go beyond the boundaries that a course of action should observe for the group. For our purposes, however, let us assume that the Diner's Club would like its dinner to meet a certain aesthetic level. This would become the group's fifth criterion.

Step 3—Suggestions of Possible Solutions

As with question "d" above, the Reflective Thinking procedure does not provide a method for listing possible solutions. A group may choose its own technique. For instance, members could choose to brainstorm proposals. Another technique would be to perform steps 1 and 2 of the NGT procedure. Let us assume that in this step the Diner's Club comes up with the same list of proposed foods that it generated in the example of NGT.

Step 4—Evaluation of Solutions

This step includes the major aspect of Step 3 in the NGT model. Both steps emphasize that this is the time when members should come to understand

the meanings and implications of each proposed course of action. The evaluation of solutions in Reflective Thinking, however, goes far beyond Step 3 of NGT. Groups using Reflective Thinking take each idea in turn and evaluate it. Evaluation is performed by judging the proposals in terms of the extent to which they met the criteria and boundaries that the group set in Step 2. In our example of the Diner's Club, the group makes the judgments shown in Table 13.3.

TABLE 13.3

Food	Quick	Easy	Available	Plentiful	Aesthetic
Steak	Yes	Yes	No	No	Yes
Spaghetti and meat sauce	Yes	Yes	Yes	Yes	Yes
Salad	Yes	Yes	Yes	Yes	Yes
Chow mein	Yes	Yes	No	No	Yes
Hamburgers	Yes	Yes	Yes	No	No
Tacos	Yes	Yes	No	No	Yes
Hot dogs	Yes	Yes	No	No	No
Sandwiches	Yes	Yes	Yes	Yes	No
Pork chops	Yes	Yes	No	No	Yes

As you can see, the group judged that all of the suggestions were sufficiently quick and easy. It appears, however, that the group members do not have steak, hot dogs, pork chops, Chinese or Mexican foods available. They do have enough ground beef for meat sauce, but they do not have enough for hamburgers. Sandwiches do not meet the aesthetic standards of the group. This means that the members are left with only two alternatives that meet both the criteria and boundaries that they have set for their dinner. These choices are spaghetti and meat sauce and salad. Rather than trying to decide between them, the group opts to make them both.

Step 5—Implementation of Chosen Solution

Reflective Thinking does not include a special process for this step. As with NGT, a group needs to repeat all the steps in order to plan how it will implement its decisions. This time the new difficulty will be "How will we prepare the spaghetti and salad?" The steps will start all over again with this new question.

Advantages

As with all techniques, the use of the Reflective Thinking procedure has both advantages and disadvantages. On the plus side, the model leads group members to explore each proposal methodically. It can also help members make decisions in as optimizing and unbiased a manner as possible. The procedure can do this because it separates "problem analysis," "solution generation," and "solution evaluation." The model also has an air of objectivity because it uses criteria as the major basis for evaluating proposals. This objectivity may help to soften the hard feelings that could result if the group does not accept certain members' "pet" ideas.

Disadvantages

The Reflective Thinking model does have some drawbacks. One weakness is that the method assumes that people can reach consensus on criteria. This idea, in turn, presupposes that group members have a common set of values. Such values would include, for instance, what is important and what is not. For example, woe to the Diner's Club if half its members hungrily demanded a lot of food quickly, while the other half preferred to spend time preparing something really good! It may be difficult for members to agree about criteria.

Further, the model assumes that people have the ability to optimize fully. In particular, the method holds that people can think of criteria for judging solutions before they think of the solutions themselves, which is extremely difficult. It is more "natural" to think of criteria *while* judging proposals. Groups that use the Reflective Thinking procedure can fall into this "natural" process; the problem is that groups may neglect to evaluate certain proposals against all criteria. For example, in discussing its third alternative solution, a group may think of a new criterion that is particularly relevant. The group could go back and judge the first two solutions against this new criterion also. However, a group may neglect to do this. If this happens, the first two proposals have an unfair advantage. As you know, a solution will remain in the running as long as it does not fail to meet a criterion. This means that the fewer criteria that a group uses to evaluate a proposal, the less likely the possibility that the group will reject the idea. Therefore, in this case, it is unfair if the group judges the third proposal against one more criterion than the first two options. This would mean that the third option unfairly has a greater chance of being rejected.

A group can solve this difficulty by conducting a preliminary evaluation of proposals. During this preliminary discussion, the group can uncover new criteria as it examines the proposals. The group can then go back and perform a final evaluation, in which the members judge solutions against all the criteria. The problem with using both a preliminary and a final evaluation period is that it makes the procedure take even longer than usual.

Keeping these drawbacks in mind, it appears that groups should save the Reflective Thinking technique for two basic circumstances: (1) when the problem is very important and the group has a lot of time and patience for solving it and (2) when a standard set of criteria already exists that the group can use to evaluate proposed courses of action.

Table 13.4 summarizes the steps in Reflective Thinking.

TABLE 13.4 Summary of steps in Reflective Thinking.

Step 1. Awareness of the difficulty
A. What is a precise definition of the difficulty?
B. What are the symptoms of the difficulty? How has the problem manifested itself? Whom does it hurt, and how does it hurt them? Under what conditions does it hurt them?
C. How big is the problem? Is it getting worse?
D. What are the implications of the difficulty in the future? What results can be expected if the problem is not solved?
E. What is being done at present to meet the problem? In what ways are these efforts ineffective?
Step 2. Analysis of the problem
A. What causes led to the present difficulty? What conditions exist in the situation that allow the causes to act as they do?
B. Which causes are major and which are secondary?
C. What direction should our approach take? Should it deal with major causes, secondary causes, or symptoms of the problem?
D. Which requirements must a satisfactory solution meet? Do they include any of the following general criteria: the extent to which the proposal would eliminate the difficulty, the extent to which the proposal is feasible in terms of time, person-power, expense, and material? Are any further criteria specific to this difficulty?
E. Must a course of action observe any "boundaries"? Do social customs, institutions, laws and so on place a boundary on the feasibility of possible solutions? Should any of these serve as additional criteria that possible solutions should meet?
Step 3. Proposal of possible solutions
(perform through the use of either brainstorming or the silent generation of ideas)
Step 4. Evaluation of possible solutions
A. To what extent would each proposal meet each criterion for a satisfactory solution?
B. Which proposal best meets the criteria?
Step 5. Implementation of chosen solution
(perform through the repetition of the entire procedure)

INCREMENTALISM

As you know, the Reflective Thinking decision procedure demands that group members follow steps that lead to extreme optimization. This is often difficult for members to do. Incrementalism, a satisficing model, is one reaction to this difficulty.

Lindblom (1959), who created incrementalism, observed that "real life" decision makers in industry and government tend to consider only a narrow range of alternative solutions. These alternatives differ by only a small, or "incremental," degree from the status quo. Lindblom did not call this "narrow-mindedness" and criticize these decision makers. Instead, he praised the virtues of their "incremental" procedure. Lindblom's praise was based on his conviction that attempts at optimization are doomed to fail. Why did Lindblom believe this?

First, Lindblom agreed with Simon's argument that optimization is impossible because it is too demanding on our cognitive capabilities. Second, Lindblom observed that optimization requires group members to know a great deal of information about consequences and alternatives. Decision makers will possess this information if they have had previous experiences that are similar to their present situation; however, they will not have the knowledge if the circumstances are new to them. If people attempt to optimize in situations in which information is scarce, they are doomed to failure.

Third, optimization requires group members to agree on underlying values. There must be a consensus. This does not often exist when people are grappling with large, complex problems. Even an individual will have difficulty formulating a consistent set of underlying values to use as a basis for decision making. Fourth, the costs of optimization are prohibitive in resources and person-power. In addition, attempts at optimization are very time-consuming. By the time the group reaches a decision, the solution may no longer be applicable. For example, a plan to save a business from bankruptcy may be very slow in coming. If it is too slow, the business may be gone before the company can implement the plan.

As you can see, Lindblom found many reasons for believing that the process of optimization has many problems. He believed that the "incrementalist" procedure would alleviate all these problems. Decision makers can adopt Lindblom's procedure by using the following process:

1. List only those alternatives that differ "incrementally" from the status quo. These differences are based on the known or expected consequences of the alternatives. In addition, the solutions must be clearly feasible in terms of time, money, and effort to implement.
2. Compare each alternative, in turn, with the status quo and with the other possible solutions. Look for a proposal that has the best immediate consequences. Do not consider long-range goals and ideals.
3. Choose the best alternative through a voting process.
4. If a new problem appears, go through the entire procedure again.

Lindblom hoped that a series of incremental changes of this sort would lead

to a favorable outcome and that, consequently, group policy would steadily, if slowly, improve. Lindblom called this process "muddling through."

Advantages

Incrementalism has some virtues as a decision-making procedure. These virtues, however, are exactly the opposite of what Lindblom believed they would be. Lindblom believed that his technique would be useful in the following situation: (1) the consequences of alternative courses of action are uncertain, (2) the current situation is unacceptable, and (3) the stakes are high. Lindblom was wrong, however. In this type of situation it is best that groups *not* use his incrementalism process. Instead, groups facing this situation *must* expend the effort necessary to make an optimal decision.

What type of situation, then, could reveal the virtues of Lindblom's process? His method is useful if (1) members know the consequences of alternative courses of action, (2) the current situation needs only slight adjustments, and (3) the stakes are low. In this type of situation, the incrementalism procedure is a useful way to save a group from the unnecessary detail inherent in optimizing procedure.

In Chapter 12, we discussed the theory that Janis and Mann (1977) proposed regarding how levels of arousal affect decision making. Their theory is useful for a group trying to decide whether or not to use Lindblom's method. As you recall, Janis and Mann proposed a series of questions within their decision-making process. The first two questions were, "Is the present course of action sufficient?" and "Is the most available alternative a sufficient improvement?" These two questions are identical to the incrementalist strategy. If a group answers "yes" to either question, Lindblom's model is adequate for the group. If, however, the answer to both questions is "no," the group should move on to a more optimizing procedure.

In addition, the incrementalism procedure has another virtue. It uses a voting strategy, which is often a good idea; however, a group must be careful when it uses a vote to solve problems. It is true that the optimizing method, calling for a consensus on criteria, is problematic. If serious differences in values exist among group members, reaching a consensus is difficult. Thus, voting is often the only reasonable strategy to resolve group conflicts. There are disadvantages to voting, however. The final vote may ignore the needs of minority groups, and the group cannot claim that it reached its decision using objective criteria.

Thus, a group may need to perform an incremental strategy in response to inherent group conflict. If it does, however, the group needs to be aware of the potential problems when it votes. The group should make concessions to the minority in its decision. It should also ensure that all interested parties are involved in the decision-making process.

Disadvantages

The incrementalist procedure may alleviate the problems we have outlined above in regard to optimizing; however, Lindblom's method is badly flawed. Lindblom is correct that optimization is problematic; however, he tries to alleviate its difficulties by wishing them away. For instance, it is true that the members need not worry about a lack of information if they limit their alternatives to those that differ only slightly from the status quo. Is this an adequate solution? It is also true that groups do not have to worry about differences in underlying values if a "winner-takes-all" vote decides the issue. Again, is this a good way to alleviate the problem?

People do not invest much time and effort, nor do they tax their cognitive abilities, if they use Lindblom's incrementalist procedure; however, they also do not have the opportunity to come up with fundamental improvements in current policy. As you can see, Lindblom's procedure may address the problems of optimizing, but it does so in a way that limits decision makers.

Further, Lindblom's procedure appears to be dangerously conservative, despite his claims that it is not. The incrementalist process is useless when a group needs to make a major change in policy. The method also allows voting majorities to maintain the status quo, no matter how reasonable the arguments of minorities. In addition, the model is aimless. Instead of moving toward goals, it moves away from problems. Lindblom sees this as a virtue. We do not see it that way. With no goal in mind, a group can "muddle" its way to disaster. Similarly, a group could make a series of incremental changes in the right direction but still be unable to stop disaster from overtaking it.

RESEARCH ON FORMAL PROCEDURES

Thus far in this chapter we have examined why scientists believe that groups ought to make better decisions when they use formal procedures than when they use a free discussion format. We have described some formal procedures and also discussed how each one's design should fit certain situations and not others.

Except for our examination of brainstorming, however, we have not talked about any of the research on this topic. Many studies have tested the claims that scientists make about formal procedures. For the remainder of this chapter we will present an analysis of this research.

Point for Researchers to Keep in Mind

Before our analysis, however, we must remind our readers of an important point we made at the beginning of this chapter: Formal procedures are in some sense "unnatural." As a result, it can be difficult for groups to follow them. This point has two important implications.