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Issues in Managing
Group Creativity

An Example of Group Problem Solving

Jan shifted uncomfortably in her chair as she surveyed the other members in the group. She had never worked with any of them very closely and was a little apprehensive. From previous encounters, she had pegged Sally as bright and a little domineering. Fred as being bright and intense, and unable to articulate his thoughts very well, and Joy as being slightly reserved and highly critical of the ideas of others.

In recent weeks, Jan had been under intense stress as director of personnel for the DHF Company. Due to the recession, her boss had directed her to fire 80 employees. Although DHF is committed to equal employment opportunities, it has a longstanding policy of “last hired, first fired.” She and the other members of her committee must decide who will be let go.

Given the little she knows about the other members (who were assigned to her from other departments), Jan is unsure of whether the group will be able to reach much agreement. She has had several years of personnel experience, however, and is confident that she will be able to come up with some workable ideas.

Jan and Sally begin the meeting by proposing several ideas that are immediately criticized by Fred and Joy as being unworkable. Joy suggests a lottery system, but this idea is criticized by Sally, Joy then counters with a justification of her idea. With the group at an impasse, Jan proposes an idea involving development of an outplacement program. No one criticizes this idea or makes any other comments about it. Sally then suggests the use of job sharing, which is immediately criticized by Joy.

At this point, Fred suggests his first idea and it is met with silence. He
member: "Well, it was just a thought," crosses his arms, and leans back into his chair. Fred doesn't say anything else during the rest of the meeting.

Sally now proposes the idea of merit examinations, which is criticized by all except Fred, who remains silent. Joy recommends dropping the retirement age. Jan says he knows this is not feasible. Sally asks which departments contain the people who were last hired. Jan calls her and suggests recording all merit increases. She immediately criticizes her own idea, and the rest of the group agrees with her.

Joy asks if they should be recording some of their ideas as they go along. Jan agrees and suggests that Joy become the recorder. Joy agrees and takes out a pen and a piece of paper.

Sally begins to get impatient and encourages the group to come to a decision, implying that they have been wasting time. Jan agrees with Sally and recites that the merit exam idea can be discussed again. The rest show little enthusiasm for discussing this idea again. Sally then proposes that the group brainstorm to develop new product ideas in order to turn the company around financially. That way, she says, they might be able to avoid firing anyone. Joy says that such an idea is not in the charge to their committee and they should get back on the track.

Eventually, the group manages to develop a list of 12 ideas and begins discussing ways of implementing them. During this discussion, the group criticizes several of the ideas as being unworkable. Fred begins making paper airplanes.

With time running out for their scheduled meeting, Jan assembles her expert knowledge about the personnel field and pushes the group to go along with her solution preferences. There are no objections, and Jan ends the meeting by thanking them all for their help and telling them she will let them know what her boss thinks of their ideas.

With some modifications, this discussion actually took place in a group I observed. You've probably been in similar groups many times. You are given a problem to solve, but you haven't had much, if any, experience working with the other people assigned to you. In addition, you have little idea of what resources the group possesses and of how best to develop some workable solutions. Typically, you flounder around until someone makes a suggestion that is minimally acceptable to most of the group. Then you explore this idea in some detail, usually with frequent criticisms. At this point, you might continue to accept and reject ideas, or it might become apparent that each group member has a different perception of what the problem is. You now have to go back to square 1.

If you have been in such groups, you must likely experienced considerable frustration. When problem-solving groups operate without any type of plan, group members frequently end up dissatisfied. Moreover, these groups

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frequently have trouble producing high-quality solutions. Minimally acceptable solutions are often all that they can hope for.

Using Guidelines

Unfortunately, there are no simple behavioral recipes for dealing with all types of problem-solving groups. Every group is different, just as every individual is different. What will help one group manage its activities may be entirely inappropriate for another group.

Fortunately, there are rules of thumb that individual groups can use to guide their behavior in solving problems. Although these guidelines may not work for all groups, they have not been found to be applicable to many different kinds of groups, so an individual group can have some confidence in them.

Whenever classes of events and activities can be observed frequently and in large numbers, predictability is possible if patterns of behavior emerge. The laws of probability dictate that linkages can be established between certain behaviors and outcomes within specified limits of confidence. However, the limits of confidence are meaningless if only a few observations are made on infrequent occasions. Thus the knowledge base used to guide group behavior must originate from established behavior patterns observed across many types of groups in many situations. Otherwise, there can be no predictability and any guidelines will be worthless.

Although the group problem-solving literature is not sufficiently well established to permit 100% accurate predictions about group behavior, enough lierence exists to allow tentative predictions. Used cautiously, these predictions can form enough of a base to allow most groups to improve their functioning; used incorrectly, both the group and the study of group problem-solving will suffer. The uneasy silence that has always been maintained between theory and practice can be disrupted at the slightest provocation.

If we can assume that valid and reliable guidelines do exist for structured group behavior during problem-solving, then managing group problem-solving should be just a matter of applying the right prescriptions at the right time. It should be. The actual case, however, is that most guidelines have been developed in conjunction with a rather limited type of problem-solving situation.

Most available problem-solving guidelines apply to well-structured problems. These guidelines typically include enough information about the current state of the problem, the desired state, and how to close the gap, so that very little creative problem solving is required. When there is one "correct" solution, routine procedures generally work quite well. By compari-
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A group is, quite simply, a collection of two or more persons who interact for some common purpose. Not all group members may agree on this purpose, but the purpose exists nevertheless. A group's purpose may have been developed internally by consensus, mandated by the group's formal or informal leader, or imposed by conditions or an authority outside the group. Groups come in all sizes and generally can be distinguished by the diversity of resources and characteristics of their individual members. Although some groups may be either homogeneous or heterogeneous with respect to the characteristics of their members, all groups—like snowflakes—are unique. Each group develops its own identity and standards of behavior that make it unlike any other group.

One dictionary defines managing as "a dynamic, ongoing process that involves bringing something about, succeeding in accomplishment, and directing, governing, and controlling in action or use." In the context of managing groups, managing involves the activities of planning, organizing, directing, staffing, and controlling. Regardless of how the term is defined, however, managing is a process without a discrete beginning or end. People who manage groups cannot follow a basic schedule, with the steps all neatly laid out. Rather, managing groups usually involves cycles of activities that must be repeated over and over again, although not necessarily the same way each time. Furthermore, the process of managing a group involves the ability to assert some degree of control over how the group functions. Unless a group is controlled, it cannot be said to be managed.

It should be evident now that problem-solving groups need to be managed when they are dealing with ill-structured problems. But this is only part of the picture. Groups also need to be managed when (1) the group members lack experience, training, and task-relevant abilities, (2) essential resources are in short supply, (3) conflict exists among group members, (4) goals are unclear and motivation to achieve them is low, and (5) group cohesion works at cross-purposes to organizational objectives. Other conditions might also indicate the need for managing groups, but these five and the nature of the task seem to be the most important.

When group members lack experience, training, and the abilities needed to get the job done, the manager is usually responsible for rectifying the situation. Often the manager can have some say about the experience level of group members when selection is done. The manager can also see that group members receive training and develop the skills they need to perform their jobs. The manager can obtain required resources to make up for a resource lack by acquiring or redeploying them, hiring the boundary-spanning role to obtain vital information, or using formal channels to request additional personnel, supplies, or materials. When conflict arises within a group, it generally falls to the manager to resolve it. The manager can do this by acting as a referee, bringing in a third party to mediate the conflict, or referring the conflicting parties to some outside source of help. Most managers deal with lack of goal clarity and lack of motivation on a fairly regular basis. Managers often handle lack of goal clarity by using MBO and informal conferences, while they typically gloss over motivation problems, assuming they are taken care of by the use of external rewards or by referral to a counselor. Finally, the manager can counteract the negative aspects of group cohesion through the use of individual consultations with "key" group members, team building, or even structural changes in the worker's jobs.

Clearly, there are many areas in which managers can have an impact on their groups, either by using the authority of their position or by attempting to influence group members personally. However, having the potential to manage groups is not always the same as being able to manage them. There are many restraining factors that can make this task exceedingly difficult. For example, managers do not have the power to control and administer certain types of rewards, time cannot always be manipulated, acquisition of resources can become bogged down in bureaucratic procedures, and managers themselves can lack the abilities needed to plan, direct, organize, and control a group effectively.

Note that the same factors that determine whether a group should be managed also determine whether a group should not be managed. A group handling a well-structured, clearly understood problem for which routine procedures are available will require little or no management. Similarly, management will not be needed when the group members possess adequate experience, training, and task-relevant abilities, sufficient resources are available, no major intergroup conflicts exist, goals are clear, and the group members are motivated to achieve them, and the group's cohesiveness does not work at cross-purposes to organizational objectives.
Managing Group Creativity

Webster defines creativity as "creative ability: artistic or intellectual ability." But for our purposes, we are defining creativity as a problem-solving process that involves bringing something new into existence. It is a set of activities by which custom-made solutions are developed to reduce or close a perceived gap between what is and what should be. For example, if you own a small business that sells computer hardware and your sales are not at the level you would like, you have a problem. Let's assume that you have the motivation and the resources to solve this problem. If there are no appropriate routine solutions, you would need to use creativity to solve it. You must develop tailor-made approaches to the problem—even if the approaches are identical to those used by others in your business. If you are not aware of these other solutions, you will have to develop your own. Creative products do not need to be new to the world; they need only be new to your own perceptual and cognitive world. If you create it, then it is creative.

Group creativity is a similar matter. What is created by a group and is new to it is creative. Thus, whenever a group uses creative problem-solving techniques to solve an ill-structured problem, it works through a creative process to produce a product that is unique to that group. It doesn't matter (from a definitional standpoint) whether other groups have produced similar or identical products. If a group-generated product is new to the group, it must be considered creative.

Managing group creativity is an altogether different matter. There are those who maintain that the term group creativity is a misnomer. They suggest that only individuals can be creative, since creativity is an individual matter. Consequently, it is inappropriate to talk about managing group creativity. If it doesn't exist, it can't be managed.

The fallacy of this argument stems from the fact that group creativity is more than the sum of the creative contributions of each group member. Groups possess a synergistic potential that allows them to operate beyond the capabilities of a given member on certain types of tasks. The interaction of each member's creative potential enables most groups to produce creative solutions of far greater quality than could be produced by an individual working alone.

This is not to say, however, that groups will always be more creative than individuals. The dynamics of group functioning often place considerable constraints on a group's ability to reach its potential. For instance, groups can be less efficient than individuals when time is diverted from a task to satisfy social interaction needs or when conflict develop among group members.

In order to maximize the potential of groups, groups must be managed. The fulfillment of the synergistic potential of a group is not something that should be left to chance. Group leaders can exert considerable control in helping groups to attain this potential, but a delicate balance must be maintained in meeting individual, group, and organizational needs and objectives.

Perhaps the most difficult aspect of managing group creativity is ensuring that the group achieves its potential while the individual members do not. For a group to be optimally effective, the creative potential achieved by each member has to mesh with the potential achieved by every other member. If all the members are left to their own devices and work toward maximizing their individual potentials, the group is not likely to reach its synergistic potential. Among other things, dysfunctional competition can develop. The parts of a group must fit together just as the parts of an engine must fit together. If the parts of a system do not mesh properly with each other, the system is not likely to work very well.

What, then, is involved in managing group creativity to ensure optimal group functioning? Although the research evidence doesn't lend itself to any definitive conclusions, enough information is available to allow at least a few tentative thoughts on the matter.

First, a group leader must be capable of assessing and using the resources present in the group members. A leader must learn about the creativity strengths and weaknesses of each member. And a leader must somehow decide how to use these strengths and weaknesses for the benefit of the entire group. For example, the leader must evaluate the creativity readiness of the attitude and cognitive disposition of members toward convergent and divergent thinking as well as the ability of the members to defer judgment. If some members are deficient or overly developed in one of these areas, the leader should take steps to make the necessary corrections.

Second, a group leader is responsible for establishing a creative climate within the group. A leader must ensure that the conditions that will predispose the group to produce creative solutions are present in the group. Among the important group conditions that a leader can control to some extent are openness to the ideas of others, willingness to take risks, perception of the internal environment as nonthreatening, feeling of freedom and spontaneity, and a general atmosphere of trust. (Other important conditions will be discussed in Chapter 3.)

A third area in which a group leader can manage group creativity involves...
the composition and roles of the group members. Although a leader cannot always control who is in the group, a leader can do several things to take advantage of the types of members who make up the group. For instance, recent research into brain hemispheric dominance has many implications for how group members can be used to produce creative ideas. More will be said on this in Chapter 5. The roles played by the group members are related to effective group outcomes and can be managed by a group leader. Some of the most important are the roles of task facilitator, maintenance facilitator, and internal process monitor.

Fourth, a leader can exert considerable control over the creative problem-solving process itself. A leader can structure the process to be used, coordinate its duration and timing, and suggest specific methods to bring out each member's creative contributions. Perhaps the most important element that a group leader can manage is the separation of the problem-solving process into relatively distinct stages. In particular, a group leader can make sure that idea getting and idea evaluating—activities fundamental to the development of creative solutions—are separated.

Finally, a group leader can manage the creative products produced by the group. A leader can clarify the group members' perceptions of different types of products, assist them in evaluating their products' uniqueness and feasibility, suggest criteria to use in deciding which idea(s) to select, help gain outside acceptance for the group's ideas, help "sell" the group's products, and work with the group in evaluating the outcomes of its products.

Being Motivated to Manage

These five elements—diagnosis of a group's resources, establishment of a creative climate, the content, the process, and the product—all can be managed by group leaders. However, not all group leaders have the skills, the motivation, and the time to manage groups, even though they may have the potential to do so. Of these, the motivation to manage is perhaps the most significant.

It is very easy to ignore development of the creative potential of groups and rely, instead, on the chance contributions of individual members. Many managers spend most of their time "putting out fires." It seems that there is always some minor crisis that requires their immediate attention. As a result, they have little time or desire to get involved in managing group creativity. Their priorities and rewards are not well established, and their motivation is not likely to change.

However, being unmotivated to manage group creativity is not a crime. Nor does it warrant that all managers must motivate themselves to manage group creativity. If it were, there probably would be a considerable loss in group and organizational productivity.

Not all groups need to be creative. Some groups may spend very little time on creative problem solving, some may spend a lot of time, and others may spend equal amounts of time on creative problem solving and on routine problem solving. A major determinant of the amount of time that any group spends on creative problem solving should be the nature of the problems it has to deal with. As already mentioned, only problems that are ill structured require creative problem solving.

When a group needs to deal with ill-structured problems, it is important that its leader be motivated to manage the problem-solving process. If group leaders facing such problems attempt to develop solutions on their own or leave the creative process in their groups to chance, the resulting solutions are not likely to be of high quality. Clearly, a group leader's motivation to manage group creativity can have a direct influence on the outcome of the creative problem-solving process.

Just as a leader needs to be motivated to manage group creativity, so also must group members be motivated to participate in the creative problem-solving process. If the group members lack this motivation, they will have a low readiness for creative problem solving and most of their efforts will be disgusted or halffared.

It is a major responsibility of a group leader to assess the members' motivation in this area and to take any necessary steps to improve it. For instance, a leader can often increase the members' motivation simply by showing them how they can benefit from using a creative approach. A leader can also increase motivation by working with the members to identify gaps between what is and what should be in the group. Once the group recognizes these gaps, the members are likely to want to reduce or close the gaps.

The motivation to manage is also important in a group's relations with its external environment. Very few, if any, groups exist in isolation. Most groups depend on their interactions with the larger system of which they are a part. Groups need a variety of resources from the larger system to perform, and the groups are needed by the larger system. In an insurance company, for example, the sales force needs information, training, personnel, money, and so forth. The sales force then uses these resources to help the larger organization achieve its objectives. Without this mutual dependence, neither the group nor the organization could survive.

When a group is engaged in creative problem solving, it is, therefore, essential that the leader both help the group obtain the resources it needs and clarify how the problem fits into the larger scheme of things. If the manager isn't motivated to do these things, the group won't be able to perform efficiently or effectively.
Self-Managing Versus Self-Perpetuating Groups

Groups, like most open systems, strive to maintain a balance between their inputs and their outputs. In general systems theory, this particular state is referred to as homeostasis or dynamic equilibrium; in the presence of organizational life, the actions required to achieve this state are known as survival.

Most groups, especially those in bureaucratic systems, have a self-preservation need that they can fulfill only by maintaining a continuous flow of inputs, transforming these inputs into outputs, and then using feedback to make any necessary corrections. A group’s efforts in these activities are often motivated by its need to perpetuate its existence. In rare instances, a group’s need to perpetuate itself can overshadow its need to achieve the objectives of the larger organization. And if a group successfully perpetuates itself, its members often develop feelings of isolation and inviolability.

Although not all groups get carried away with justifying and perpetuating their existence, a group’s need to achieve homeostasis can consume a considerable amount of the members’ energy. Group leaders, in particular, can become unduly preoccupied with managing the flow of routine events, to the exclusion of other activities. When this occurs, leaders often find that they have little energy left for managing group creativity—typically a nonroutine activity. Routine matters are usually more immediate and much more noticeable. As a result, group creativity is quite frequently left to chance.

Leaving creativity to chance in this way produces a dilemma for a manager. On the one hand, the manager would be irresponsible to neglect the routine activities necessary to achieving the group’s objectives. On the other hand, the manager is just as irresponsible in neglecting the management of the group’s creative activities when the creativity is needed to resolve problems related to the group’s objectives.

It would be very easy to say that this dilemma can be resolved if managers would only seek a balance between their responsibilities for both routine and nonroutine activities. In fact, I just said it! Managers should seek such a balance. However, for a variety of reasons, this balance is not always easy to achieve.

Another way out of this dilemma is for managers to work at making their groups self-managing in the area of group creativity. If managers did this, group creativity would not be left to chance and managers could direct most of their energies to routine activities and, especially, to long-range planning—another often-neglected managerial activity.

Self-managed group creativity can also provide group members with a greater sense of participation, assuming that they need it (testing this assumption would be a managerial responsibility). In addition, self-managed group creativity can increase group member satisfaction, identification with the group, and the quality of the product.

Achieving self-managed group creativity is a major responsibility of a group leader. This should be approached gradually by the manager, however, so that all group members can integrate the skills and behavior needed for creative problem solving as they gain experience with them. Too rapid an approach could result in an superficial acceptance of the concept of self-managed creativity. In this regard, a group leader should reduce slowly the number of structuring behaviors used to manage the group as it becomes evident that the group is capable of assuming increased self-controlling responsibilities.

Of course, self-managed group creativity is an ideal that is easier to aim at than it is to achieve. What is more important is for a group to develop a commitment to reaching a state of pure self-management. Whether or not this goal is actually achieved probably doesn’t matter very much. The process of striving toward this ideal is what is important, since it is likely to increase the group’s ability to manage its own creative efforts without draining the manager’s energies.

Summary

Problem-solving groups that operate without the benefit of a plan often produce unhappy members and low-quality products. The use of guidelines can help groups better manage their problem-solving activities. And in most cases, there can be considerable productivity from using guidelines when they are based on frequent observations of large numbers of groups.

Most guidelines that now exist were developed to assist groups in resolving well-structured problems. These guidelines will be of little help to groups faced with ill-structured problems. For these problems, custom-made procedures involving creative problem-solving approaches are more appropriate.

The process of managing groups involves controlling and directing the activities of two or more persons who interact for some common purpose. Managing groups is not a single, discrete activity, but a process involving a cycle of activities that are performed over and over, possibly in a different way each time.

Most groups need to be managed when they are confronted with ill-structured problems. However, groups also need to be managed at certain other times, such as when the group members lack experience and when essential resources are in short supply. There are various measures that group
leaders can apply to manage these conditions. Group leaders must also learn how to overcome certain external obstacles.

Creativity is defined here as a problem-solving process that involves bringing something new into existence. In order to be considered creative, the products generated by a group need only be new to the group.

Often, the process of managing group creativity is viewed as a contradiction in terms, since some maintain that creativity is strictly in individual matter. This position is weakened, however, by the fact that most groups are capable of synergistic functioning. That is, groups possess a potential that enables them to produce a product that can exceed in quality the sum of all the individual contributions. (In other words, the whole is greater than the sum of its parts.)

The achievement of group synergy in creative problem solving should not be left to chance. A group leader should seek to ensure that group members fulfill their maximum creative potential, but not necessarily their maximum individual potential. It is more important for the group member to work well together than for any one member to shine above the rest.

There are several specific actions that a group leader can take to manage group creativity, one of the most important pertaining to motivation. A key element in managing group creativity is the ability of leaders to assess both their own motivation to manage and the motivation of group members to use the creative process. The motivation of leaders is also an important determinant of their ability to acquire resources for their groups.

Most groups attempt to maintain a steady state of functioning in performing their assigned routine tasks. In some cases, this steady state can develop into a group obsession to perpetuate itself. Furthermore, the regulation of routine group functions often diverts so much energy from a group that a dilemma is created for the group leader. It can become very difficult for a group leader to manage adequately all the routine and nonroutine tasks in his or her charge. Often, the result is that the group uses routine problem-solving procedures to handle both types of tasks; when, in fact, it should use creative procedures for the nonroutine tasks.

Resolving this dilemma is a matter of managers’ working to achieve a balance in the energies devoted to routine and nonroutine activities. In addition, group leaders can improve the situation by striving to help their groups become self-managing in the area of creative problem solving. Any measures taken to move groups in this direction, however, must be introduced gradually. Although achieving a self-managed group might be more of an ideal than an actuality, it is important that groups move toward this ideal.

2

Individual Versus Group Creativity

Justifying Group Creativity

Picture yourself sitting alone, trying to be creative. Think of the last problem you worked on that required the development of creative solutions. What did you think about? What approach did you take? Did you generate ideas serially and then reject each one until you found a satisfactory solution? Or did you examine all the ideas in detail without rejecting any until they all were generated? Did you find yourself daydreaming from time to time? In general, how successful do you consider yourself to be at individual creativity?

Now picture yourself in a group you have been in that tried to develop creative solutions to problems. Did the group approach the problem in a much different way than you would have alone? Were the quantity and quality of solutions generated higher or lower than you might produce on your own? Did the group use a formal, structured approach, or did it just ramble on? In general, how satisfied were you with the group experience?

When you analyze your individual and group creativity experiences, you may discover that you have a decided preference for one over the other. You may feel that you can be more creative when you are alone than when you are in a group, or vice versa. If you were to generalize this experience, you might conclude that either individuals or groups are more creative.

To a certain extent, comparison of individual versus group creativity may be irrelevant. The real question may be: In what situations and under what conditions will individuals or groups be more appropriate? Both individual and group creativity are valid ways to generate ideas, and both are needed. Using just one method and rejecting the other would be like throwing the baby out with the bath water.
Before proceeding, we need to distinguish between two types of individual creativity. In the first type, an individual generates ideas alone and selects one or more of those ideas to solve a problem. In the second type, a collection of individuals generates ideas alone and pools the ideas (a so-called nominal group). The group then applies one or more ideas from this pool to a problem. For the remainder of the discussion on this topic, the first type of creativity will be referred to as individuals working alone and the second type will be referred to as nominal group or a collection of individuals working alone.

Most of the time, a nominal group (or any other type of group) will outperform an individual working alone—at least in terms of idea quantity. The research literature is less clear on whether a nominal group will outperform a brainstorming group, in which individuals generate ideas in a face-to-face situation. The lack of current research in this area and the comments of numerous individuals suggest that further investigations comparing nominal and brainstorming groups are not needed. Many people believe the matter is settled—at least in terms of idea quantity. The common understanding is that nominal groups produce more ideas than brainstorming groups. In fact, because of the complexity of the issues involved, reliability questions about measuring instruments, and the number and type of variables involved, the matter is far from settled.

Creativity research, like any other area in the behavioral and social sciences, is more an art than a science. Very few statements of fact can be made about most of the variables involved in the study of creativity. Instead, we often have to rely on intuitive statements that arise from a synthesis and interpretation of the existing literature. For example, it was noted in Chapter 1, that because of the synergistic potential of most groups, group creativity is not a misnomer. That is, groups are capable of producing creative products that exceed the sum of the individual contributions. Many other intuitive/research-based statements could be made about the relative superiority of groups over individuals. It could, for example, be said that groups have more knowledge and information than individuals working alone, make fewer errors, develop more unique problem perspectives, and use participation to increase acceptance and understanding of solutions (Mayer, 1983; Huber, 1980), or that groups are more likely to make risky decisions and to produce higher-quality and more diverse ideas (Stein, 1975).

In addition, research has demonstrated that on certain types of problems, groups are superior to individuals working alone (Hedman, 1983). For example, problems with many parts that can be solved through a division of labor are more likely to be resolved by groups than by individuals. And groups will outperform the average individual problem-solver on problems with multiple stages and variable solutions.

The advantages of groups over individuals working alone have been discussed in the research literature for many years. For example, groups can reject incorrect solutions and check errors (Barnlund, 1959; Shaw, 1952), and group membership will assure a greater interest in the task (Barnlund, 1959).

Groups also have certain negative aspects that must be weighed against their positive features. Groups consume more time than individuals working alone (Honeck, 1943), use social pressure to push for conformity rather than a high-quality solution (Mayer, 1963), engage in conflict that can delay problem solving and create ill will among the members (Huber, 1980), make riskier decisions (Wallach, Kogan, and Bein, 1962), and are subject to reactions among group members that can result in fewer ideas being generated (Stein, 1975).

In spite of this research and intuitive thinking about the positive aspects of group problem solving, it’s important to remember that the general superiority of groups over a collection of individuals working alone has yet to be established conclusively. Research on group creativity has been rather narrowly focused on the idea-generation stage, using comparisons of brainstorming and nominal groups. Other aspects of group creativity and other techniques have been almost completely ignored.

There is, nevertheless, enough evidence to suggest tentatively that group creativity is a valid area of study for both researchers and practitioners. A manager cannot ignore the resources that groups can bring to bear on a problem (process loses misunderstanding) and the synergistic potential of groups when deciding whether or not to use groups over individuals working alone. Groups just have too much potential to do without them for solving many types of problems.

**Types of Groups**

A key element in managing any group is knowledge and awareness about the type of group needed to solve a problem. Under some conditions, one type of group may be more appropriate than another. If you don’t choose the best type of group for a particular problem, the outcome may be a low-quality solution and group members who are dissatisfied with the problem-solving process. Furthermore, awareness about types of creative problem-solving groups will help you in understanding and interpreting the research literature on individual versus group creativity that will be discussed later in this chapter.
chapter. For these reasons, the major categories of creative problem-solving groups are discussed next.

In general, creative problem-solving groups can be divided into two major types: brainstorming and brainwriting.

**Brainstorming Groups**

Brainstorming groups generate ideas orally and can be subdivided into structured and unstructured groups, depending on the type of procedure used. Structured brainstorming groups are an agreed-upon procedure to guide the activities involved in generating ideas; unstructured brainstorming groups (sometimes referred to as the research literature as interacting groups) use oral idea generation without the benefit of an agreed-upon procedure.

An example of structured brainstorming is Osborn's (1954) brainstorming procedure, in which a preselected group generates ideas, guided by certain rules and principles—the most important of those being deferred judgment. Although the casual observer may not see a lot of structured activity during an Osborn brainstorming session, a close look usually reveals a highly orchestrated process conducted by an experienced group leader.

In stark contrast to structured brainstorming, unstructured brainstorming is usually characterized by little directed effort and a general lack of momentum. In the typical scenario for unstructured brainstorming, a group of individuals sit down and "brainstorm" about some problem, often without the benefit of a group leader to facilitate the process. Most ideas proposed are criticized, and dominant individuals can be observed exerting their influence. Such a group was described at the beginning of Chapter 1. Unfortunately, unstructured brainstorming gives a bad name to Osborn's method in particular and to creative problem solving in general.

**Brainwriting Groups**

Brainwriting groups generate ideas silently, in writing, and also can be subdivided into two categories: nominal and interacting. In nominal brainstorming, a collection of individuals generates ideas alone, and the ideas are then pooled and duplicates eliminated. Such groups are referred to as nominal, because they are groups in name only. That is, they generate ideas as if they were a group, but the ideas are not shared among the individuals. Interacting brainstorming groups, in contrast, share the ideas generated by the individuals. However, no discussion takes place about any of the ideas.

In nominal brainstorming groups, the participants write down their ideas on cards and then pass them to a group leader. One of the most popular nominal brainstorming methods is the nominal group technique (DeBono, Van de Ven, 

and Oslin, 1975). In using this method, the participants have an opportunity to see the ideas of others, but only after all ideas have been written down and passed.

An example of interacting brainstorming is the brainstorming pool technique (Goschka, 1980, VanGundy, 1981), originally developed at the Battelle Institute in Frankfurt, Germany. A small group of individuals sits around a table, and each individual writes ideas on a sheet of paper, places the paper in the center of the table, exchanges it for someone else's paper, and then examines the paper for any new ideas or modifications that might be suggested. The process continues until an agreed-upon time limit is reached, when all the papers are collected, the ideas are evaluated at a later time.

**Evaluating Brainstorming and Brainwriting**

Like any other decision, the choice of one type of group over another involves certain trade-offs. You just cannot always have your cake and eat it too. Creative problem-solving groups are no different, since each one comes with its own built-in advantages and disadvantages. Thus, once you have decided to use group creativity, you must then decide what type of group you want to use.

Your decision can be facilitated by looking at some of the criteria relevant to using brainstorming and brainwriting. Although there are many criteria that could be applied, an examination of the research literature and consideration of the techniques' practical aspects suggest eight major criteria: number of ideas, quality of ideas, time/money costs, interpersonal conflict potential, accommodation of social interaction needs, contribution to group cohesiveness, pressure to conform, and task orientation.

This listing is not presented in any particular order. The actual importance of any one criterion is relative and will depend on individual objectives and constraints. However, it is possible to rate brainstorming and brainwriting against these criteria. Such a rating should make the major advantages and disadvantages clearer as well as aid you in choosing from among the various group procedures. (The questionnaire in Figure 2-1 is provided as an additional aid; to locate Figure 2-1, as well as any other figures in the book, see the List of Figures on page 14.)

In Table 2-1, structured and unstructured brainstorming and nominal and interacting brainwriting have been rated against the eight criteria on a scale of high to low. In addition, the quantitative rating (the numbers in parentheses) has been provided to help you make overall comparisons between the different procedures.

In the rating of the procedures, "high" is a positive rating for idea quantity
and quality, accommodation of social interaction needs, contribution to group cohesiveness, and task orientation, and "low" is a positive rating for the other criteria. For example, a procedure's ability to produce a large number of ideas is an advantage, while a procedure's inability to control for conformity pressures is a disadvantage (it is for this reason that both a high and low rating may be quantified with either a 1 or 3).

Also, it was assumed that the procedures would be used as they are intended. It often happens that a group will decide, for example, to "brainstorm" on a problem without following the rules and principles set forth by Osborn.

Before looking at Table 2-1 in more detail, note that all the ratings are fairly subjective. The rating for idea quantity and quality, interpersonal conflict potential, group cohesiveness, and pressure to conform are based partly on empirical evidence. The ratings of the other procedures are based primarily on my own knowledge of the procedures and experience in using them. Thus, not only are the ratings subjective, but they also reflect my own generalized perceptions. After you become more familiar with the procedures, you may want to rate them for your own use. You may also want to use additional criteria.

In examining Table 2-1, certain fairly obvious observations can be made. First, idea quantity and quality should be highest for interacting brainstorming, medium for nominal brainstorming and structured brainstorming, and lowest for unstructured brainstorming. The major reasons for these differences are related to some of the other criteria. For example, if a procedure minimizes or eliminates interpersonal conflict and pressures to conform while maximizing task orientation, it should be easier for a group to generate more high-quality ideas than when these conditions do not exist. Thus brainstorming procedures restrict the participants to written idea generation and circumvent social problems within groups. (Incidentally, interacting brainstorming was rated higher than nominal brainstorming because the former uses other people's ideas to help stimulate ideas.)

Second, with the exception of unstructured brainstorming, all the procedures are relatively low in time and money costs. The low time and money costs can be attributed to the time limits and specified and reasonably efficient processes used for structured brainstorming and nominal and interacting brainstorming. Since unstructured brainstorming usually involves no time limit and no specified processes, the time and money costs are generally higher than for the other group procedures.

Third, brainstorming has a clear-cut advantage in eliminating the potential for interpersonal conflict. The silent, written generation of ideas used in brainstorming makes it impossible for individuals to engage in conflictual behaviors. Although the conflict potential for structured brainstorming was rated medium, the actual amount of observable conflict will be determined largely by the group leader's ability to control the discussion and mediate differences of opinion. Of course, not all conflict is detrimental to group creativity, and in some cases, it can heighten and sharpen the members' creative abilities. However, it is probably best to eliminate the possibility of conflict whenever a group leader lacks the skills to manage it.

Fourth, the major strength of brainstorming lies in its ability to accommodate social interaction needs and contribute to group cohesiveness. Because some people have stronger needs than others to interact in a social setting, brainstorming is the method of choice when such interactions are desired and not seen as having a negative effect on a group's ability to develop creative solutions. If the majority of the group members are task-oriented, brainstorming is more appropriate—at least in terms of this single criterion. The evidence is also fairly strong in indicating that brainstorming contributes to group cohesiveness. The very nature of the close interpersonal contacts that take place in brainstorming groups predisposes such groups to developing cohesiveness. Of course, brainstorming has no provision for interpersonal contact, and as a result, it will have little or no impact on group cohesiveness. This is especially true in nominal brainstorming groups, where there is no opportunity for interaction.

Fifth, brainstorming has a decided advantage in eliminating all pressures toward group conformity. Either because of the influence of a dominant member or general consensus, groups frequently can exert pressure on

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Structured</th>
<th>Unstructured</th>
<th>Nominal</th>
<th>Interacting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea quantity</td>
<td>Medium (2)</td>
<td>Low (1)</td>
<td>Medium (2)</td>
<td>High (3)</td>
</tr>
<tr>
<td>Idea quality</td>
<td>Medium (2)</td>
<td>Low (1)</td>
<td>Medium (2)</td>
<td>High (3)</td>
</tr>
<tr>
<td>Time/money costs</td>
<td>Low (3)</td>
<td>Medium (2)</td>
<td>Low (3)</td>
<td>Low (3)</td>
</tr>
<tr>
<td>Interpersonal conflict potential</td>
<td>Medium (2)</td>
<td>High (1)</td>
<td>Low (3)</td>
<td>Low (3)</td>
</tr>
<tr>
<td>Accommodation of social interaction needs</td>
<td>High (3)</td>
<td>High (3)</td>
<td>Low (1)</td>
<td>Low (1)</td>
</tr>
<tr>
<td>Contribution to group cohesiveness</td>
<td>High (3)</td>
<td>High (3)</td>
<td>Low (1)</td>
<td>Low (1)</td>
</tr>
<tr>
<td>Pressure to conform</td>
<td>Medium (2)</td>
<td>High (1)</td>
<td>Low (3)</td>
<td>Low (3)</td>
</tr>
<tr>
<td>Task orientation</td>
<td>High (3)</td>
<td>Low (1)</td>
<td>High (3)</td>
<td>High (3)</td>
</tr>
<tr>
<td>Numerical Totals</td>
<td>20</td>
<td>13</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>
members to adhere to a particular norm or standard of behavior. When this
conformity is accepted without questioning, the group climate is not likely to
be conducive to freedom of thought and risk taking. And creativity in such
groups may suffer accordingly. This phenomenon, known in the research
literature as "groupthink" (Janis, 1972), often occurs in groups that are
highly cohesive. Like interpersonal conflicts, cohesion can be a plus or a
minus for a group, depending on how it is handled by the group leader.

Sixth, all the group procedures except unstructured brainstorming have a
relatively high task orientation. This emphasis is due solely to the structured
procedures used in most formal brainstorming and brainwriting. In addition,
group leaders may have some influence on a group's task orientation. The
importance of this criterion is especially great for groups operating under
significant time constraints. In this situation, excessive social interaction
may prevent a group from accomplishing its tasks and goals. A heavy task
emphasis will enable a group to be more successful and, in some instances,
will even help a group to produce a larger number of ideas.

Finally, the quantitative ratings in Table 2-I illustrate the overall utility of
the four procedures. According to the numerical results, structured brain-
storming and interacting brainwriting appear to be the best procedures when
all the criteria are considered together. Nominal brainwriting is a close
second, but unstructured brainstorming is a distant third.

In general, it might be concluded that when social factors are important to
a group, structured brainstorming should be used. When social factors are not
important or certain social dysfunctions need to be controlled, either of the
two brainstorming procedures should be used. In any event, both brainstorm-
ing and brainwriting procedures involve certain tradeoffs that suggest the
need to use both whenever possible.

Research on Individual Versus Group Creativity

The need to examine the issue of individual versus group creativity is,
from an historical point of view, a practical one. The investment in resources required to use groups
dictates that groups be used only when necessary. If an individual or a
collection of individuals working alone can produce equal or better results
with a smaller resource investment (time or money), it makes little sense to use group problem solving. Conversely, it would be
foolish to rely on individual creativity when more acceptable outcomes could be achieved with a group. Like any other endeavor, creative problem solving
should be both effective and efficient.

The discussion on individual and group creativity that follows centers on
idea quantity and quality. Other issues could also have been included but
were not in order to keep this review relatively brief. This discussion is not
intended to be exhaustive and all encompassing for the issues that are dealt
with. Its primary purpose is to highlight the complexity of the issues involved
in researching individual and group creativity and to demonstrate that the
research findings are far from conclusive. The reader interested in a more in-
depth examination of these issues, as well as many others, is advised to consult Stein's Stimulating Creativity (Vol. 2, 1972a). In so, Stein provides a
detailed and inclusive look at group creativity research, especially as it pertains
to nominal brainstorming and structured brainstorming.

Idea Quantity and Quality

Idea quantity and quality are separate issues that have been combined here
because they have often been researched jointly. Of all the issues involved in
comparing individual and group creativity, these two are the most heavily
researched. Unfortunately, all this research has not led to many definitive
statements about idea quantity and quality. Although some tentative statements are indicated, the failure to control for several key variables makes
much of this research suspect. More will be said on this matter later on.

As noted earlier in this chapter, nominal brainstorming groups appear to be
capable of producing more ideas than structured brainstorming groups. The
research supporting this finding is fairly extensive (e.g., Bouchard, 1967;
Bouchard, 1972b; Dunnette, Campbell, and Jaiswal, 1963; Madsen and
Finger, 1976; Stueart, 1974; Taylor, Berry, and Bock, 1958). Research also
appears to support the contention that nominal brainstorming groups outper-
form structured brainstorming groups in terms of idea quality (e.g., Bouch-
ard, 1969; Bouchard, 1972b; Campbell, 1968).

However, there is some research that suggests contradictory results. For
example, in a secondary data analysis, Taylor, Berry, and Bock (1958) found
that adjusting for the total number of responses made (using covariance
procedures) produced results suggesting the superiority of structured brain-
storming groups over nominal brainstorming groups in terms of idea uniquen-
ness. However, this finding held for only one of the three types of problems
studied. Pines and Meadow (1963) also obtained similar results, although it
must be noted that the participants in their study (who used structured brain-
storming) were instructed to defer judgment, whereas those in the
Taylor et al. study were not.

Other research in this area has dealt with comparisons of structured brainstorming and synectics; nominal brainstorming and unstructured brain-
storming; unstructured brainstorming and structured brainstorming; and
structured brainstorming, nominal brainwriting, and interacting brainwrit-
ing. The results of these studies indicate the following: (1) Synectics (a
Individual Versus Group Creativity

...responses while those in the Taylor et al. study had an average of 68.3 responses for the same problem. However, the brainstorming groups produced an average of 35.3 responses in Bouchard's study and 36.4 in the Taylor et al. study.

Among the reasons that Bouchard (1969) puts forth to account for these differences is the fact that participants in his study were given written responses in the brainstorming condition and oral, tape-recorded responses in the brainstorming condition. In the Taylor et al. study, the responses from both nominal and brainstorming groups were oral and tape-recorded. The similar number of responses recorded for the brainstorming groups in these two studies may be directly attributable to the recording method, since identical group procedures were used.

Parnes and Meadow (1963) provide additional reinforcement for this view. Their study found that brainstorming groups outperform nominal groups. All participants recorded their ideas in writing as they spoke them. Thus only a small difference or no difference at all may be observed between nominal and brainstorming groups when responses are written.

Bouchard, citing a study by Honig and Neuman (1964), provides a simple explanation for the effects of response type on number of ideas produced. This study found that a response requiring ten minutes when written requires only two minutes when spoken. Honig and Neuman also speculate on other possible factors. For example, some group members may speak a lot to fill a silence, and writing down responses may represent a commitment to their ideas that some people are unwilling to make. In any event, the method of recording ideas may determine differences in idea quantity more than the type of group procedure used.

Types of Problems Used
Research has used both real and unreal problems. An example of a real problem is one in which participants are asked to think of ways to increase the number of European tourists who visit the United States; an example of an unreal problem is one in which participants are asked to consider the consequences of having an extra thumb.

Most of the research using these types of problems has shown that people are able to generate more ideas for unreal problems than for real problems (e.g., Harari and Graham, 1975; Magnus and Harris, 1980). This rather surprising result might be due to the tendency of participants to react in a silly manner and have fun with, say, the thumbs problem. As a result, their imagination is increased and they produce more ideas.

Nevertheless, both the real and the unreal problems used in the research are very similar to the types of problems most groups encounter in "real life." The problem groups in organizations face usually have more signific...
cance to them than problems contrived by an experimenter. Consequently, research is needed in which individuals and groups are compared on problems that the participants perceive to have some direct effect on them—that is, problems in which a solution would have more practical implications.

Validity of Experimental Instructions

Another factor that may provide an alternative explanation for the superiority of nominal groups is the experimental instructions given to study participants. In research methodology, the question is one of internal validity. That is, did the experimental manipulations really affect the variables being measured? In regard to experimental instructions, the question is: Does telling people to follow the rules of structured brainstorming mean that they will behave in the intended way?

At present, few attempts have been made to determine whether study participants used brainstorming as it was intended to be used. Instead, most researchers have simply assumed that they were comparing the effects of structured brainstorming and nominal brainstorming. However, it is possible that what they really were comparing are the effects of structured brainstorming and nominal brainstorming. If this is true, all the conclusions and inferences that have been made about nominal and structured brainstorming groups may have been derived from what is really an experimental artifact.

Solution Acceptance

Despite the controversial nature of the research on different types of group creativity, it must be remembered that groups—in general—will be superior to a single individual working alone. This superiority stems from the practical implications involved when comparing a group with an individual. These implications will be most significant when a manager needs to decide whether to attempt to solve a problem alone or involve a group in the process.

One of the most important of these implications is solution acceptance. Because the dynamics involved in participating in problem solving, groups have the potential to increase the group members’ acceptance of a solution. And if solution acceptance is increased, group member satisfaction and involvement in solution implementation may also increase. Understanding the nature of these variables will help managers choose between individual and group problem solving. More will be said on this matter in the next section.

Acceptance of a solution by group members is a fundamental group problem-solving principle. Groups do not need or want to have input into every problem that comes up, but evidence indicates that groups want to participate in decisions that affect them directly. The best solution in the

world will be of little value if it is not supported by those who are affected by it or by those who must implement it. And acceptance is not likely if one person (such as a group leader) solves a problem alone when others should have been involved. As a result, if group members have an opportunity to interact and discuss a problem, often the dynamics of the process can ensure solution acceptance and implementation.

One of the spin-offs of participation in problem solving is greater member satisfaction with the final solution. Group members who participate in a decision generally will be more satisfied than group members who are handed a decision made by one individual (e.g., Coeh and French, 1948; Carey, 1972). Note, however, that satisfaction does not always guarantee follow-through to implementation (Powell and Schletter, 1971).

Although the research literature is much less conclusive on implementation than it is on satisfaction, there is some evidence to suggest that group participation also increases effective implementation of a solution. People will often help carry through to completion what they have helped create. Nevertheless, there may be many instances in which such behaviors are not observed. For example, someone who helps produce a group solution but who does not believe it to be the best possible solution may not be highly motivated to implement it. Of course, the fact that some people may be more motivated to implement a solution when they have participated in developing it must be kept in mind as a positive feature of using groups.

Choosing Between Individual and Group Problem Solving

From the preceding discussion, it should be evident that there is a major difference between individual creativity and nominal or interacting brainstorming creativity. Individual creativity involves the generation of ideas by a single individual, and the ideas are not shared with others as part of the idea-generating process. Brainwriting also uses individual creativity, but either the ideas are simply pooled (nominal brainwriting) or written feedback is shared with others and then the ideas are pooled (interacting brainwriting).

As a result of this difference, there will be two decisions involved in choosing between individual and group creativity. First, you must decide whether you wish to generate ideas alone or to use a group. Second, if you decide to use a group, you must then decide whether to use brainstorming or brainwriting.

In making the first decision, the factors you will need to consider are (1) the amount of time available, (2) subordinate acceptance, (3) desired solution originality and uniqueness, (4) subordinate needs for social interaction, (5) the amount of information you possess about the problem, (6) the
need to increase group cohesion, (7) the personal development needs of subordinates, and (8) the conflict potential within the group.

The individual versus group decision-making questionnaire in Figure 2-1 will help you use these factors in your decision making. In using this questionnaire, you can rate the relative importance of each factor, given a particular problem. Keep in mind that not all situations are alike. At times, it may be better to use individual problem solving, and at other times, group problem solving may be more appropriate. For example, in some situations, you may feel that the need to increase group cohesion outweighs your own need to produce a quick solution.

Note that this questionnaire does not qualify as a valid and reliable scientific instrument. No research has been conducted on its ability to predict the appropriateness of individual or group problem solving for different types of situations. Nevertheless, it should serve as a rough guide in helping you sift through the various factors involved in deciding whether to use individual or group problem solving.

**Figure 2-1. Individual versus group decision-making questionnaire.**

Instructions: Read each question carefully and place an X above the one response to each question that best describes your general reaction. Do not spend too much time on any one question; your first reaction is likely to be the most accurate one.

<table>
<thead>
<tr>
<th>Question</th>
<th>Very little</th>
<th>Some</th>
<th>Just enough</th>
<th>More than?</th>
<th>Much more?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much time do you have to solve this problem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. How likely is it that you could obtain more time to solve this problem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. How likely is it that your subordinates will accept the solution if you try to solve this problem by yourself?</td>
<td>Unlikely</td>
<td>Somewhat</td>
<td>About 50%</td>
<td>Somewhat</td>
<td>Likely</td>
</tr>
<tr>
<td>3. How important is your subordinates' need to interact with one another while solving this problem?</td>
<td>Unlikely</td>
<td>Somewhat</td>
<td>About 50%</td>
<td>Somewhat</td>
<td>Likely</td>
</tr>
<tr>
<td>4. How important is acceptance of the solution to this problem?</td>
<td>Unimportant</td>
<td>Somewhat</td>
<td>Hard to tell</td>
<td>Somewhat</td>
<td>Important</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Completely</th>
<th>Somewhat</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do your subordinates believe you can implement a solution to this problem if they do not participate in solving it?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Completely</th>
<th>Somewhat</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>How likely is it that solutions uniqueness and originality would be decreased if you tried to solve this problem by yourself?</td>
<td>Unlikely</td>
<td>About 50%</td>
<td>Somewhat</td>
<td>Likely</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Completely</th>
<th>Somewhat</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do your subordinates value the need for unique and original solutions?</td>
<td>Unimportant</td>
<td>Somewhat</td>
<td>Hard to tell</td>
<td>Somewhat</td>
<td>Important</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Completely</th>
<th>Somewhat</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do your subordinates need to interact with one another in solving this problem?</td>
<td>Unimportant</td>
<td>Somewhat</td>
<td>Hard to tell</td>
<td>Somewhat</td>
<td>Important</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Very little</th>
<th>Some</th>
<th>A moderate</th>
<th>Quite a bit</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much information do you have about this problem?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Not very useful</th>
<th>Slightly useful</th>
<th>Moderately useful</th>
<th>Useful</th>
<th>Very useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>How useful is the information you have about this problem (with respect to its ability to help you solve this problem alone)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. How important is it that your subordinates become more cohesive?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>Somewhat important</th>
<th>Important</th>
</tr>
</thead>
</table>

14. How much do the advantages of solving this problem by yourself outweigh the need for your subordinates to become more cohesive?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
</table>

15. How important is it for your subordinates to develop their creative problem-solving skills?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>Somewhat important</th>
<th>Important</th>
</tr>
</thead>
</table>

16. How much do the advantages of solving this problem by yourself outweigh the need for your subordinates to develop their creative problem-solving skills?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
</table>

17. How likely is it that interpersonal conflict will develop among your subordinates if you attempt to solve this problem as a group?

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Unlikely</th>
<th>Somewhat unlikely</th>
<th>About 50%</th>
<th>Somewhat likely</th>
<th>Likely</th>
</tr>
</thead>
</table>

18. How much do the advantages of solving the problem by yourself outweigh the chance of interpersonal conflict developing among your subordinates?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>A little</th>
<th>Not at all</th>
</tr>
</thead>
</table>

Scoring and Interpretation: Change each of your responses for questions 1, 2, 4, 6-10, 13-16, and 18 to a numerical score between 1 and 5, going from left to right. For example, if you placed an X over the response "more than needed" for question 1, you would score it as a 4. For questions 3, 5, 11, 12, and 17, assign a "reverse" score to each of your responses. That is, score these questions by going from right to left. Thus, if you placed an X over the response "somewhat likely" for question 3, it would be scored as a 2. Once you have scored all 18 questions, add up the scores to determine your total score.

As a rough guide to interpreting your total score, you probably should involve your subordinates if your score is between 70 and 90. If your score is between 40 and 69, give serious consideration to using group problem solving. Your ratings on the time factor (questions 1 and 2) may help you to make this decision. For example, if you have little time and are unlikely to be able to obtain additional time, you probably will want to attempt to solve the problem by yourself. In this situation, time constraints will outweigh most of the other factors. If your score is between 18 and 39, however, you will be better off solving the problem yourself, regardless of your ratings on the time factor.

If you decide to use group problem solving, you need to select between brainstorming and brainstorming. Although some of the factors involved in choosing between individuals and groups also apply in this situation, there is enough of a difference to justify using a separate approach.

The factors involved in choosing between brainstorming and brainstorming are those already discussed and presented in Table 2-1. These factors are (1) idea quantity, (2) idea quality, (3) time/money cost, (4) interpersonal conflict potential, (5) accommodation of social interaction needs, (6) contribution to group cohesiveness, (7) pressure to conform, and (8) task orientation.

A questionnaire has also been constructed to help you to use these factors in choosing between brainstorming and brainstorming (see Figure 2-2). As with the previous questionnaire, this questionnaire is not scientifically valid and must be used and interpreted with caution. However, it should greatly simplify your decision making in this area. Before completing this questionnaire, you might find it helpful to review the material on the different criteria discussed earlier.

Figure 2-2: Brainstorming versus brainstorming decision-making questionnaire.

Instructions: Read each question carefully and place an X above the one response that best describes your general reaction. Do not spend too much time on any one question; your first reaction is likely to be the most accurate one.

1. How important is it to you the number of ideas you produce to help solve this problem?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>Somewhat important</th>
<th>Important</th>
</tr>
</thead>
</table>

2. How important is it to you the quality of ideas you produce to help solve this problem?

<table>
<thead>
<tr>
<th>Importance</th>
<th>Somewhat unimportant</th>
<th>Hard to tell</th>
<th>Somewhat important</th>
<th>Important</th>
</tr>
</thead>
</table>
3. How much time is available for solving this problem as a group?

- Much more than needed
- More than needed
- Somewhat more than needed
- A little more than needed
- Just enough

4. How task-oriented do your subordinates tend to be when working together as a group?

- Completely
- Somewhat
- Hard to tell
- A little
- Not at all

5. How important is it for your subordinates to interact with each other while solving this problem?

- Important
- Somewhat important
- Hard to tell
- Somewhat unimportant
- Unimportant

6. How important is it for your subordinates to become more cohesive as a group?

- Important
- Somewhat important
- Hard to tell
- Somewhat unimportant
- Unimportant

7. How likely is it that interpersonal conflict will develop among your subordinates if they discuss this problem as a group?

- Unlikely
- Somewhat unlikely
- About 50%
- Somewhat likely
- Likely

8. How likely is it that your subordinates will exert pressure on each other to conform if they discuss this problem as a group?

- Unlikely
- Somewhat unlikely
- About 50%
- Somewhat likely
- Likely

Scoring and Interpretation: Choose each of your responses to a numerical score between 1 and 5, going from left to right. For example, if you placed an X over the response "unimportant" for question 1, score it as 1. After you have changed each X to a numerical score, determine the totals for question pairs 1 and 2, 3 and 4, 5 and 6, and 7 and 8. When you have added together the responses for each pair, you should have four separate sets of scores, each ranging between 2 and 10.

To interpret your scores, use the scoring guide presented in Table 2-2. Under each column of question pairs, possible score ranges, from 2 to 6 and from 7 to 10. Read across all the columns and locate the row in which all your response totals fall within.
Summary

From our personal experiences, most of us have developed preferences for using creativity alone or in groups. In actual practice, however, the issue may not be whether one approach is better than another. Both individual and group approaches are needed, depending on various situational factors.

Individual creativity can be divided into two types. The first type involves individuals working alone and not sharing or pooling their ideas. The second type is similar to the first except that the ideas are pooled after being generated by individuals working alone.

Group creativity also consists of two types: brainstorming and brainwriting. In brainstorming, individuals generate ideas orally in a face-to-face setting; in brainwriting, a collection of individuals generates ideas alone in writing, without any oral interaction (a nominal group). The ideas are then shared and pooled or pooled without sharing. In general, a nominal group will outperform a brainstorming group in terms of idea quantity and sometimes idea quality, although the research results are far from conclusive on these issues.

Groups seem to have certain advantages over individuals working alone without pooling their ideas. For example, groups have an advantage in the amount of information and knowledge they can bring to bear on a problem, in making fewer errors, in developing more unique solutions, and in increasing solution acceptance and understanding. The disadvantages of groups include the amount of time they consume relative to individuals, the social pressure often used to force conformity, the internal conflict that can delay problem solving and create ill will, and the interruptions that can reduce idea quantity. In spite of these disadvantages, groups have a definite edge over individuals working alone. The real issue seems to be whether brainstorming procedures or nominal procedures are best for creative problem solving.

Of the four major types of groups (structured brainstorming—oral idea generation using an agreed-upon procedure, unstructured brainstorming—oral idea generation using no agreed-upon procedure; nominal brainwriting—individual idea generation without face-to-face interaction and pooling of ideas; and interacting brainwriting—individual idea generation with sharing and pooling of written ideas), structured brainstorming has received the most attention in the research literature. Nominal brainwriting and unstructured brainstorming have also received a fair amount of attention. Very little research has been conducted on interacting brainwriting methods.

In choosing between brainstorming and brainwriting procedures, eight criteria can be used: idea quantity, idea quality, time/money costs, interpersonal conflict potential, accommodation of social interaction needs, contribution to group cohesiveness, pressure to conform, and task orientation.

When rated against these criteria, structured brainstorming and interacting brainwriting are tied as the highest-rated procedures. Nominal brainwriting is a close second, and unstructured brainstorming is a distant third. However, these ratings reflect overall capabilities of the procedures. In actual use, there are certain tradeoffs involved with any procedure. For example, the brainstorming procedures rate high or medium in interpersonal conflict potential, accommodation of social interaction needs, contribution to group cohesiveness, and pressure to conform. The brainwriting procedures rate low on all these criteria. Because of these tradeoffs, both types of procedures might be used whenever it is feasible to do so.

In surveying the literature on studies comparing structured brainstorming and nominal brainwriting groups, the evidence suggests that nominal brainwriting groups produce more and higher-quality ideas than structured brainstorming groups. However, a secondary analysis of one research study indicates that adjusting for the total number of responses made produces opposite results for idea quality. Research on other types and variations of brainstorming and brainwriting procedures has resulted in mixed findings. More research on these procedures is needed.

Several explanations have been offered to explain the superiority of nominal brainwriting over structured brainstorming. First, written versus oral recording of responses in generating ideas may account for some of the differences. When brainstorming groups use oral recording procedures and brainwriting groups use written procedures, fewer ideas may be produced in the brainwriting groups due to the commitment involved in written recording, among other factors. Second, the problems used in experimental research on group creativity often are so unlike the problems encountered in real life that any observed differences in group procedures may be meaningless. Until more studies are conducted that use problems directly affecting the participants, any conclusions about the superiority of one procedure over another must be tentative at best. Finally, differences in group procedures may be explained by examining the validity of the experimental instructions used. In most cases, researchers have failed to determine whether telling study participants to use a particular procedure actually results in the intended behaviors.

Aside from all the research attempting to account for differences between individual and group creativity, it must be remembered that groups have certain practical advantages over individuals. When compared to a single individual solving a problem alone, groups have a major advantage in being able to ensure acceptance of a solution and, to some extent, group membe
satisfaction and commitment to solution implementation. When a manager needs to choose between individual and group procedures, these factors should be major considerations.

When a manager must choose between individual and group creativity, two decisions are involved. The first is whether to generate ideas alone or in a group. Some of the factors involved in making this decision are the amount of time available, subordinate acceptance, desired solution originality and uniqueness, subordinate needs for social interaction, the amount of information you possess about the problem, the need to increase group cohesion, the personal development needs of your subordinates, and the interpersonal conflict potential. A manager who decides to use a group must now decide what type of brainstorming or brainwriting procedure to use. Factors involved in making this decision include idea quantity, idea quality, time/money costs, interpersonal conflict potential, accommodation of social interaction needs, contribution to group cohesion, pressure to conform, and risk evaluation. Questionnaires are provided to assist in making both of these decisions, but they must be used with caution because their validity has not been scientifically established.

Establishing a Creative Group Climate

Nature of a Group Climate

I happen to live in the southwest part of the country, where the sun shines almost every day. Since I had lived most of my life in the northeastern United States, it was a welcome change to move here several years ago and find that there was very little cloudy and overcast weather. However, after a few summers of months without a cloud in the sky, I began longing for a place where the skies were cloudy all day.

When I shared this feeling with people native to the southwest, I found that most of them did not feel the same way. They felt that cloudy skies were depressing—even if they lasted only a day or two. I like one type of climate and they like another.

There is no doubt that climate can affect our moods. Some of us are affected more than others, and we all are affected differently. I like a balance of sun and clouds, while others may prefer more of one than the other. Like perceptions of beauty, weather preferences are an individual matter. What affects my behavior and attitudes may not affect yours.

Climate has several different features, including temperature, precipitation, and wind. Each of these features can affect life in both constructive and destructive ways. Temperature, precipitation, and wind all affect the growth and nourishment of plants and trees. When just the right amount of each climate feature is provided, growth will be maximum. Too little or too much of any feature may be destructive. Thus, if the temperature is too hot, there is too little rain, and the wind is inadequate for pollination, the growth of many living things will be retarded, if they cannot adapt to such conditions.

Similar types of effects can be observed in groups if an analogy is made