Chapter 32

Group Behavior and Performance

J. RICHARD HACKMAN AND NANCY KATZ

Although a scattering of influential empirical studies on group behavior and performance were conducted in the first half of the 20th century (e.g., Shaw, 1932), the psychological study of small groups did not begin to flourish until the war years of the 1940s. In the United States, nearly all available resources, including the nation's scientific talent, were brought to bear on winning World War II. Among the matters for which scientific knowledge was required were the dynamics and performance of small groups—for example, to identify the factors that shaped the performance of infantry squads in combat, or to properly design and lead groups that provided back-home support for the war effort.

The fruits of the research carried out in those years are summarized in the extensive compendia of empirical findings about group behavior and performance published by Hare (1976) and by McGrath and Altman (1966), and in the informative sampling of that research reprinted and discussed in Cartwright and Zander's influential *Group Dynamics* (1953; subsequent editions in 1960 and 1968). Despite often conflicting findings, gaps in knowledge, and a paucity of theory, it appeared that a reasonably solid platform of empirical knowledge about groups had been established. On that platform, surely, there would develop a steady stream of research that, in the Lewinian tradition, would simultaneously advance social psychological theory and provide evidence-based guidance about how best to structure, support, and lead groups of various kinds.

Those lofty aspirations were not fully realized. What had been a robust and fast-flowing stream of social psychological research on groups had by the 1970s gradually diminished to a trickle. Ivan Steiner, who himself had published a landmark text in the field (Steiner, 1972), was eventually driven to publicly inquire of his scholarly colleagues, "Whatever happened to the group in social psychology?" (Steiner, 1974). The answer, Steiner suggested, was that the revival of interest in individual attitudes documented by McGuire (1969) in the second edition of the *Handbook of Social Psychology* had captured social psychologists' attention to such an extent that group research had entered a state of hibernation.

Research responds to the mood of the times, Steiner hypothesized, but with about a decade lag. The earlier flowering of group research had indeed been in response to the war years and the relatively tranquil period that followed. And, it was the pervasive individualism of the 1960s that prompted the subsequent focus in social psychology on intraindividual processes. The social unrest that characterized the late 1960s and early 1970s, he predicted, would soon reinvigorate small group research.

As John Levine and Richard Moreland documented in the previous edition of the *Handbook of Social Psychology*, it did not happen (Levine & Moreland, 1998; see also McGrath, Arrow, & Berdahl, 2000; Moreland, Hogg, & Hains, 1994; and Steiner, 1986). What happened is that small group research gradually but definitively changed its home address. Although group behavior and performance once again is a highly active field of study, it has moved out of its ancestral home in social psychology. As social psychologists increasingly have drawn upon cognitive neuroscience and evolutionary theories to explain social phenomena, small group research has migrated to the periphery of the field. And the discipline of sociology, now increasingly reliant on the models and methods of economics, has not taken up the slack. These days, it is mainly scholars in schools of communication,

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organizational behavior programs in business schools, and industrial–organizational psychology programs who are doing the bulk of the research on groups (see, for example, Frey, 1999, 2003; Hogg & Tindale, 2001; Ilgin, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; Kozlowski & Ilgen, 2006; Mathieu, Maynard, Rapp, & Gilson, 2008; Salas, Goodwin, & Burke, 2008; Salas, Stagl, & Burke, 2004).

Groups Are Changing

It is a time of transition not just in who is doing research on group behavior and performance but also in the very phenomena under study (Mortensen, 2009). Traditionally, groups tended to be intact, stable, and tightly bounded social systems. Now, the composition of many groups shifts so often that it can be nearly impossible to pin down who actually is a member (Wageman, Nunes, Burruss, & Hackman, 2008). Traditionally, group members tended to be co-located and to interact almost exclusively face to face. Now, many groups are so widely distributed across geographies and time zones that members may never even see one another, relying instead on an ever-expanding set of technological resources to coordinate their activities (O'Leary & Cummings, 2007). Traditionally, most task-performing groups generated some identifiable product, service, or decision. Now, groups handle a much wider variety of tasks that often have considerable complexity and uncertainty, such as providing organizational leadership (Berg, 2005), carrying out negotiations (Behfar, Friedman, & Brett, 2008), and managing organizational change initiatives (Hackman & Edmondson, 2008). Traditionally, work groups in organizations had a designated leader. Now, increasing numbers of groups are self-managing with members sharing leadership responsibilities (Manz & Sims, 1987). Traditionally, groups operated within a single organizational context. Now, groups often include members from two or more different organizations that may have different policies, practices, and cultures (Dess, Rasheed, McLaughin, & Priem, 1995). And, finally, groups traditionally have been created top–down by an organizational manager or, in the laboratory, by the experimenter. Now, increasing numbers of groups are self-created, often using electronic technologies, to explore shared interests (Shirky, 2008) or to pursue activist social agendas (Andrews, Ganz, Baggetta, Han, & Lin, in press).

An iconic group from the past would be a coal mining team, a clearly bounded and highly stable group whose members are deeply dependent on one another for safely carrying out their collective work, and who commonly spend a considerable portion of their nonwork time together as well (Goodman & Leyden, 1991). An example of the new kinds of groups that are seen these days is a research team consisting of both university researchers and pharmaceutical company scientists that is charged with investigating a new compound that may have therapeutic potential. These scientists work in laboratories in three different countries located in three different time zones, they communicate and coordinate using electronic technologies exclusively, and group composition gradually changes over time in response to the different expertise that is needed at different stages of the project. This team is emblematic of what Hackman and Wageman (2005b) call *sand dune* teams—dynamic social systems that have fluid rather than fixed composition and boundaries. Just as sand dunes change in number and shape as winds change, teams of various sizes and kinds form and reform within a larger social system in response to changing external demands and requirements.

Chapter Plan

The new group phenomena just described will require those of us who study them to reconsider our traditional conceptual paradigms and research methodologies. In particular, group scholars will need to move beyond reliance on laboratory experiments and survey-based field methods in studies of group dynamics and performance and give greater attention to structural, temporal, and contextual forces that powerfully shape group behavior. In the words of Moreland, Hogg, and Hains (1994), we may need to go "back to the future" if we are to generate conceptually interesting and practically useful theories and findings about new forms of group life. Several approaches to the study of group behavior reviewed in this chapter, although prominent in the early days of the field, have fallen from favor. As will be seen, these approaches offer some possibilities for research and theory that may be especially well suited to the emergent new realities of group life.

The first section of the chapter provides an analysis of just what is meant by the concept "group," exploration of what it means to say that a group is "effective," and identification of the major dimensions that distinguish various types of groups. The second section reviews and analyzes six approaches to the study of groups, each of which provides a distinctive "lens" through which groups can be observed and analyzed.

The third section explores a number of specific issues that lie at the frontier of scholarly work on group behavior and performance. Rather than provide a comprehensive review of all the work that has been carried out on groups since the excellent review by Levine and Moreland (1998) in the last edition of the *Handbook of Social Psychology*, the chapter emphasizes those issues that appear to lie on

the present cutting edge of the field—some of which have received substantial attention by contemporary group researchers but others of which have not. Throughout, the focus is exclusively on the group *qua* group; other group-related phenomena, such as group influences on the beliefs, attitudes, and behaviors of individuals and the dynamics of intergroup relationships, are not addressed in detail (for an early review of group influences on individuals, see Hackman, 1992; for analyses of the dynamics of intergroup relations see the chapters by Dvoidio & Gaertner and by Yzerbyt & Demoulin in this volume).

GROUPS AND THEIR ATTRIBUTES

The term "group" is commonly and casually used to refer to an enormous variety of social forms, which is one reason why empirical findings about group and team behavior (we use the two terms interchangeably) have been less cumulative than one would hope and expect. This chapter deals only with the behavior and performance of *purposive groups*—that is, real groups that exist to accomplish something.

Numerous definitions of groups have been proposed in the scholarly literature (e.g., Baron, Kerr, & Miller, 1992; McGrath, 1984; Mohrman, Cohen, & Mohrman, 1995; Offermann & Spiros, 2001). Our use of the term, following Alderfer (1977), is relatively simple and inclusive: *A group is an intact social system, complete with boundaries, interdependence for some shared purpose, and differentiated member roles*. It is possible to distinguish members of groups from nonmembers even if they do not have regular face-to-face contact and even if membership changes frequently. Moreover, members depend on one another in pursuing their collective purposes, and they develop specialized roles within the group as they do so. Casual gatherings of people who have no shared purpose lie outside our domain, as do reference groups, identity groups, and statistical aggregations of the attributes, estimates, or preferences of people who do not actually interact with one another (e.g., the average SAT scores of a college's "group" of incoming students).

As social systems, groups are perceived as entities by both members and nonmembers (Hamilton, Sherman, & Rodgers, 2004), they create and redefine realities, and they generate outcomes that can be legitimately attributed to the group as a unit. The proper concepts for describing groups, therefore, are those that are situated at the group level of analysis, not those that describe the cognitive or affective processes of individual members (Larson & Christensen, 1993). To describe a collective entity such as a group as having thoughts and feelings is to significantly increase the difficulty of explicating how the states and processes of individual persons combine to shape group-level structures and interactions (Hutchins, 1995; James, Joyce, & Slocum, 1988).

Group Purposes and Performance

Because most groups have multiple purposes—some manifest and explicit but others latent and implicit—it is useful to partition them into three sets: those that have mainly to do with (1) accomplishing the work of the group, (2) strengthening the capabilities of the group itself, and (3) fostering the well-being of individual group members.

Accomplishing Work

Most groups, whether in laboratory experiments or field settings, have some piece of work to accomplish—some product, service, decision, or performance. Researchers commonly rely on relatively simple outcome measures to assess how well those groups have done, such as a group's score on an experimental task in the laboratory (e.g., the number of anagrams solved correctly) or organization-specified performance measures in field research (e.g., number of units produced, or an index of customer satisfaction).

In fact, it is conceptually and empirically challenging to develop measures of group performance that are both meaningful and psychometrically adequate. As Pritchard and Watson (1992) point out, the concept "group productivity" has been used in group research far too casually. A valid measure of productivity, they suggest, must consider both the efficiency of the group (i.e., its output relative to inputs) and its effectiveness (i.e., its output relative either to its own goals or to the expectations of others). The Pritchard–Watson approach, although attractive in theory, requires data that can be difficult or impossible to obtain in practice. An alternative that aspires to finesse that difficulty is to identify those who are served or affected by the group and rely on their assessments of the group's performance (Hackman, 2002). Although this approach accepts, for better or for worse, whatever criteria the assessors use, it does recognize the fact that consequences for a group are far more likely to derive from its clients' evaluations than from any researcher-constructed performance measure.

Strengthening Group Capabilities

Some groups have as an explicit purpose building the collective capability of the group *qua* group—for example, a research team or an educational seminar that seeks to enhance the learning capability of the group as a whole. Other examples include a crisis management team that

rehearses its response strategy so the team will be ready when and if a real crisis occurs or a student string quartet that does not expect to perform publicly but whose members seek to continuously improve their ability to play together. Even the mere act of engaging in synchronous activities, such as marching, singing, or dancing, apparently can strengthen a group by fostering individual members' attachment to it (Wiltermuth & Heath, 2009). All of these activities can increase the "social capital" of the group, which, according to Oh, Labianca, and Chung (2006), is beneficial both to the group and to its members.

Even though a group can explicitly decide to build its social capital, purposes that have to do with strengthening the group itself often are latent and, therefore, not explicitly acknowledged or addressed by group members or their leaders. For this reason, group-focused purposes have, for the most part, been analyzed more by scholars in the psychodynamic tradition (e.g., Rioch, 1975) than by those who conduct empirical studies of group performance in laboratory or organizational settings.

Fostering Individual Well-Being

Groups also exist that have no specific task other than to foster the learning or well-being of their own members. Such groups are found mainly in schools (Aronson & Patnoe, 1997; Slavin, 1980; Thelen, 1981), in workshops intended to help individuals develop their interpersonal and group skills (Argyris, 1993; Jaques & Salmon (2007), in self-help groups (Alcoholics Anonymous, 2001; Zemore, Kaskutas, & Ammon, 2004), and in therapeutic settings that rely on group techniques to help individuals deal with emotional problems (Joyce, Piper, & Ogrodniczuk, 2007; Yalom & Leszcz, 2005). In all of these settings, the success of the group is a direct function of the degree to which individual members are helped.

Less well recognized and less frequently studied is the impact of group experiences on the members of groups whose manifest purpose is something else, such as accomplishing a piece of work or strengthening the group as a performing unit. In a study of a large number of professional symphony orchestras, Allmendinger, Hackman, and Lehman (1996) found that most orchestras accomplished their main work of performing concerts quite well—but at considerable cost to individual orchestra members. The mean job satisfaction of orchestra players ranked seventh of thirteen different kinds of groups that had been studied. And players ranked ninth of thirteen on satisfaction with opportunities for personal growth and development, just below a group of federal prison guards and just above an industrial production team. Group experiences clearly can contribute positively to member well-being, but they also can have the opposite effect when the group is structured and led in ways that give collective accomplishment priority over individual well-being.

Group Effectiveness

The simplest way to assess the overall effectiveness of a given group would be to determine the degree to which it has achieved its purposes in each of the three domains just identified. Specifically, a robust assessment of group effectiveness might involve collecting data to generate answers to each of the following three questions (Hackman, 2002):

1. To what extent does the productive output of the group (i.e., its product, service, decision, or performance) meet the standards of the team's clients—the people who receive, review, or use the output?
2. To what extent do the group's social processes enhance members' collective capability to work together interdependently?
3. To what extent does the group experience contribute positively to the learning and personal well-being of individual members?

In practice, there are several nontrivial challenges and complications in using a multidimensional, cross-level criterion of effectiveness such as this. As the orchestra study mentioned previously illustrates, there commonly are tradeoffs among the three purposes. There, the work was accomplished at some cost to its members; one readily can imagine other circumstances in which the reverse would be true or in which building the capabilities of the group itself would be at the expense of the group's task performance. In an experimental study of group decision making by Kaplan (1979), for example, some groups received an intervention intended to improve the quality of members' interpersonal relationships. Compared with control groups that received an innocuous intervention, members became so entranced by their interpersonal explorations that they gave little attention to their work on subsequent tasks and group performance deteriorated significantly.

Moreover, some purposes may be irrelevant or latent for some groups in some circumstances. If a group were charged with a one-shot task of extraordinary importance such as defusing a bomb before it exploded, one would not worry much about the impact of the group experience on the group's capabilities or on members' learning. By contrast, those latter two criteria would be highly relevant for the long-term effectiveness of a police department bomb squad. Even though purposes having to do with group capability and individual learning might be latent rather than manifest, the squad's effectiveness over the

long term clearly would be affected by the degree to which those latent purposes were accomplished.

Ultimately, the selection of the criteria to be used in assessing the effectiveness of a purposive group is a value choice. But that reality is often unrecognized or unacknowledged—for example, when a researcher constructs a task that has a simple performance measure such as the right solution to a problem or the number of puzzles solved in a given time, or when a practitioner finds something that can be readily counted, counts it, and then uses that as a measure of the group's effectiveness. Both research and practice would benefit from more thoughtful consideration of the criteria that are used to assess how well a group is performing. Indeed, the mere act of actively discussing with group members the criteria that are most appropriate for assessing their performance can make explicit that which may have been unacknowledged and implicit—and, thereby, increase the chances that the group's performance processes will be well aligned with the very criteria that are being discussed.

How Well Do Groups Perform?

That reasonable-sounding question has engendered a surprising level of partisan fervor. Some scholars, such as Harold Leavitt (1975), enthusiastically tout the benefits of using groups to accomplish work. In a classic essay titled, "Suppose we took groups seriously . . . ," Leavitt suggested that groups generate so many benefits that serious consideration should be given to using groups rather than individuals as the basic building blocks of organizations. Edwin Locke and his colleagues take the contrary position in a provocative article titled, "The importance of the individual in an age of groupism" (Locke et al., 2001). A "group frenzy" has so overtaken organizational life, these authors argue that the critical role of individuals, especially in providing critical thinking, is being lost. Other scholars concur that teams can be time-wasting social forms that coerce people and cap their human potential (Allen & Hecht, 2004; Barker, 1993).

Both sides can marshal ample support for their positions from essays and commentaries to hard empirical data. On one side are books with highly promising titles such as *Hot Groups* (Lipman-Blumen & Leavitt, 1999) and *The Wisdom of Teams* (Katzenbach & Smith, 1993) as well as a good number of empirical studies that document just how well groups can perform. A study by Groysberg, Healy, and Gui (2008), for example, assessed the performance of groups of financial analysts that selected stocks to be purchased. They found that the stocks recommended by a small selection committee (four to six members) performed significantly better than either stocks selected using traditional procedures or those selected by smaller or larger committees. On the other side is Irving Janis's classic work on "groupthink" (discussed later in this chapter) that documents just how wrong groups can be in making highly consequential decisions; the voluminous literature on free-riding (also known as "social loafing" or the "Ringlemann effect") in task-performing groups (Cornes & Sandler, 1996; Karau & Williams, 1993; Mas & Moretti, 2009); and the decidedly mixed research findings about the performance benefits of group brainstorming (Dugosh & Paulus, 2005; Litchfield, 2008; Nijstad & Stroebe, 2006; Parks & Sanna, 1999; Paulus, Dugosh, Dzindolet, Coskun, & Putman, 2002).

Perhaps the most succinct statement of skepticism about group performance is the simple equation that Steiner (1972) used to explore various models of group productivity: **AP = PP − PL**. The actual productivity (AP) of a group, he showed, can be estimated by first identifying its potential productivity (PP, what the group could achieve if all member resources were used optimally) and then subtracting from that the process losses (PL) it experiences—for example, motivation decrements such as free-riding, slippage in coordination, and inappropriate weighting of members' inputs to the group's deliberations. Neither Steiner nor subsequent researchers found it necessary to append a **+ PG** (process gain) term to his equation. In the skeptical view, then, the question for researchers and theorists is how far below its potential a group will fall, not how much positive synergy members' interactions will generate.

The question of how well groups perform is sufficiently freighted with ideological considerations that it is unlikely ever to be empirically answered in a way that is satisfactory to all. Like many other matters that tap into ideological currents, this one will not be resolved either by meta-analysis or by the design of a "definitive" study whose findings will be convincing both to the group optimists and to the skeptics. In fact, it is the wrong question to ask. It is wrong because it confounds three separate and quite distinct issues:

1. When should groups be used, and when should they not?
2. How does group performance compare to that of individuals?
3. What differentiates groups that realize their full potential from those that do not?

When Groups, When Not In some circumstances there is no choice. Consider, for example, the generic task of flying an aircraft. Only individuals can fly single-seat planes, and only groups can operate planes that require synchronized input from multiple crew members. But technological

imperatives such as these are a special case. Are there more general circumstances when groups are an inappropriate or ill-advised means to accomplish a piece of work? Although little systematic research has been done on this question, some evidence is available. Creative composition, for example, involves bringing to the surface, organizing, and expressing thoughts and ideas that are but partially formed or that reside in one's unconscious. As Miles Shore (2008) has found in his research on dyadic creativity, such work is inherently more suitable for individual than for collective performance. Even committee reports—mundane products compared with novels, poems, or musical scores—invariably are better done by one talented individual on behalf of a group than by the group as a whole writing in lockstep. The social system context within which a task is performed also can strongly mitigate against teamwork—for example, when organizational policies, practices, or culture make it impossible to properly design and support teams (Walton & Hackman, 1986).

Groups tend to be remarkably passive when given a task that is inappropriate for a collective work, or when the group is poorly structured or inadequately supported, or when the broader social context is unfriendly to collaboration. A case in point is the arrangement of the physical space in which the group does its work. As Steele (1973) has found, groups tend to view their spatial arrangements as fixed even when their work space could easily be reconfigured. Members are far more likely to unquestioningly soldier on in such circumstances than to rearrange the space to make it more amenable to teamwork. The same may be true for other structural or contextual features that impair group processes or performance: Although they potentially are open to group-initiated change, members take them as given. At present, little is known about the roots of this kind of passivity or what it would take to increase group proactivity about such matters. It would be good to know more.

Group Versus Individual Performance Among the first questions addressed in small group research was the relative performance of individuals and groups (Collins & Guetzkow, 1964) and the matter continues to engage group scholars (e.g., Kerr, MacCoun, & Kramer, 1996; Laughlin, VanderStoep, & Hollingshead, 1991; Stasser & Dietz-Uhler, 2001). In one of the first studies of individual versus group problem solving, Shaw (1932) asked 21 individuals and five four-person groups to solve an intellective problem. Three of the five groups (60%) solved the problem correctly, as did three of the 21 individuals (14%). Shaw concluded that groups were superior at problem solving, perhaps because group members corrected one another's errors as they worked through the problem.

Years later, Marquart (1955) corrected Shaw's logic by noting that any group would be successful in solving Shaw's problem if it included a member who was able to solve it alone. Perhaps, he suggested, the performance of a group was more a matter of its composition than the quality of members' interaction. In a replication of Shaw's study, Marquart created "nominal" groups by randomly assigning individuals who had worked on the problem alone to hypothetical groups that never actually met. The number of nominal groups that contained a member who had solved the problem closely approximated the number of real groups that solved it. The performance of groups on this problem, he demonstrated, reflected the performance of its most competent member. Subsequently, Steiner (1966) noted that the problem used by Shaw and Marquart was a special kind of task for which group performance tracks that of its best member. Steiner then went further and identified five distinct types of tasks for which different combinatorial rules apply:

1. *Disjunctive* tasks, for which the performance of the group as a whole is a direct function of the performance of its best-performing group member. For example: a track team whose score is that of its fastest runner, or a team of mathematicians that succeeds when any member comes up with a proof that works.
2. *Conjunctive* tasks, for which the group operates at the level of its least competent member. For example: a study group in a machine-paced language course, or a roped-together team of mountain climbers.
3. *Additive* tasks, for which group performance is the sum of members' contributions. For example: a production team in which members are working in parallel, or a tug-of-war in which the group's "pull" is the sum of the pulls of all its members.
4. *Compensatory* tasks, for which a group estimate is the simple average of individual members' independent estimates. The expectation is that individuals' errors will be compensated for by others' errors in the opposite direction. For example: estimating the number of beans in a jar or the number of people present at an outdoor event, or predicting next year's fossil fuel consumption.
5. *Complementary* tasks, which can be divided into subtasks that are assigned to different members. For example: a research task that requires different activities for which members may be differentially skilled; assembly of a complex device for which division of labor brings greater efficiency than otherwise would be the case.

By disaggregating the kinds of tasks that groups perform, Steiner laid the groundwork for much more informative comparisons of individual and group performance

than previously had been possible. The present lack of consensus among scholars about the relative performance of groups and individuals, noted earlier, reflects in part the fact that groups and individuals are differentially advantaged for the various types of tasks that Steiner identified. It is regrettable that contemporary group scholars do not draw more extensively upon his simple, but powerful, conceptualization in framing and interpreting their research on group behavior and performance.

Achieving Groups' Full Potential A large group performing a disjunctive task theoretically should do well, because its most competent member should be quite talented indeed. But there is no guarantee, since process problems—in this case, the risk that the best member's contribution will be ignored or lost in the shuffle in a large group—can derail even groups that have the resources needed to perform extraordinarily well (Straus, Parker, Bruce, & Dembrosky, 2009).

More generally, competent individuals, either working alone or in nominal groups, can outperform interacting groups that are poorly structured and supported. And a great group can generate synergistic outcomes that exceed what would be produced even by extraordinarily competent individuals (Laughlin, Bonner, & Miner, 2002) and do so in a way that simultaneously strengthens the group as a performing unit and contributes to the learning and development of individual members. It all depends on the degree to which the group has, and uses well, the full complement of resources that are required for exceptional performance.

An emerging theme in current research on group performance is identification of those aspects of the group's structure, its context, and the behavior of its leaders that, together, increase the likelihood that a group will evolve into an effective performing unit (Ancona & Bresman, 2007; Hackman, 2002; Wageman, Nunes, Burruss, & Hackman, 2008). In this way of thinking, groups are viewed more as social systems that chart their own development than as mechanistic entities in which specific causes are tightly linked to specific effects. Although integrated treatments such as these do draw on research findings about specific factors that affect performance outcomes, their emphasis is on identifying the general conditions that increase the chances that a group will be able to use well its full complement of resources in pursuing its purposes.

Attributes of Purposive Groups

As noted earlier, there has been a proliferation of new forms of groups in recent years, including many that bear only modest resemblance to those that historically have been most prominent in group research—the small groups created by researchers for laboratory experimental studies and the organizational work teams studied by field researchers. As a consequence, the development of cumulative knowledge about group behavior and performance has become more daunting than it was previously, since there is now greater risk that what is learned from research on one type of group may not generalize to groups of different kinds. It may be useful, therefore, to identify the attributes that can be used to partition the universe of purposive groups, thereby facilitating comparisons across types of groups as well as assessments of the external validity of empirical findings about groups of various kinds.

Four attributes that can be used to distinguish among different types of groups are: (1) the degree to which responsibility for achieving group purposes lies primarily with the group as a whole versus with individual members, (2) the degree to which members interact synchronously in real time versus asynchronously at their own discretion, (3) the level of authority groups have to manage their own processes, and (4) the substantive type of work the group is performing.

Responsibility and Synchrony

The first two attributes, taken together, identify four distinct types of purposive groups, shown in Table 32.1. As will be seen, some of these types are both more common and more commonly studied than are others.

Face-to-face groups, the upper right quadrant in the table, are what people usually have in mind when they talk about groups and teams, and most of the existing research literature on group behavior and performance is about them. Members of such groups are co-located and work together interdependently in real time to accomplish purposes for which they are collectively responsible. They most frequently are used when achieving the group's purposes requires coordinated contributions in real time from a diversity of members who have complementary expertise, experience, and perspectives (e.g., Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Stewart & Barrick, 2000).

Table 32.1 Four Types of Groups

	Responsibility for Achieving Group Purposes	
	Individual Members	Group as a Whole
Level of Synchronicity		
Real-Time Interaction	**"Surgical" Teams**	**Face-to-Face Groups**
Asynchronous Interaction	**Coacting Groups**	**Virtual Teams**

Adapted from Hackman & Wageman (2005).

In the lower right-hand quadrant of the matrix are virtual teams, which sometimes are called distributed or dispersed groups. Members of virtual teams also share responsibility and accountability for accomplishing collective purposes, but they are not co-located and they do not necessarily interact with one another in real time. With the rapid recent advances in information and communication technologies, members are able to interact mainly (and sometimes exclusively) using electronic means and on their own schedules. Virtual teams often are larger, more diverse, and collectively more knowledgeable than those whose members interact face to face. When they work well, they can bring widely dispersed information and expertise to bear on the team's work quickly and efficiently (Kirkman, Rosen, Tesluk, & Gibson, 2004; Townsend, DeMarie, & Hendrickson, 1998). Virtual teams are most frequently used when interdependent work is required but it would be difficult or impossible for team members to perform it face to face. As will be seen later in this chapter, researchers presently are working to identify the special conditions, beyond the mere availability of sophisticated communication capabilities, that are required for such teams to overcome their special challenges.

Groups in the upper-left quadrant are what Brooks (1995) has called surgical teams. Responsibility and accountability for outcomes lies primarily with one person, the surgeon, but accomplishing that work requires coordinated interaction among all members in real time to ensure that he or she has all the information and assistance that members can provide. Brooks noted that the best software development teams are of this type, with members working closely together but with one individual, the lead programmer, having primary responsibility for the quality of the team's product. This kind of team is most often seen when a group's purposes require an extremely high level of individual insight, expertise, or creativity—metaphorically, the writing of a play rather than its performance.

Responsibility for the performance of groups in the lower-left quadrant, which are known as coacting groups, also lies primarily with individual members. Each member's work does not depend upon what the others do, and the output of the group as a whole is simply the aggregation of individual members' contributions. Because there is no particular reason for members to coordinate their activities in real time, they may or may not work in close proximity to one another (when they do not, they are essentially the same as the nominal groups that sometimes are used in research to assess the relative performance of interacting groups). A great deal of organizational work is performed by sets of people that are called teams but that actually are coacting groups. Although coacting groups cannot generate synergistic collective products (because members are merely operating in parallel), they can benefit from social facilitation when members work in one another's presence and therefore can observe others performing the same well-learned task. And, of course, the presence of coactors also can impair performance when the work requires production of unfamiliar responses (Feinberg & Aiello, 2006; Zajonc, 1965) or when the group is so large that members are tempted to free-ride on others' contributions (Harkins & Szymanksi, 1989; Latane, Williams, & Harkins, 1979). Coacting groups are most often found in settings in which there is minimal need for interdependent work by relatively homogeneous sets of group members.

Level of Authority

Four generic functions must be fulfilled when a group pursues its particular purposes (Hackman, 1986). First, of course, is to execute the work. Second is to monitor and manage work processes, collecting and interpreting data about how the group is operating and then making corrections as needed. Third is designing the group itself and securing any outside resources or support that may be needed. Fourth is choosing or defining the purpose itself. Groups vary in the amount of authority they have to fulfill these four functions—the decision-making latitude of some groups is highly restricted, whereas others have control over all aspects of group life and work.

For the most restricted groups, most decision-making authority is held by an external agent. This agent will be referred to as the group's "manager," although in practice the agent may be an experimenter, a therapist, or even some other group, depending on the group's purpose and the setting in which it operates. In a *manager-led* group, members have authority only to actually execute the task; others monitor and manage performance processes, structure the group and its context, and specify overall purposes. This type of group was common in U.S. industry in the decades after the idea of "scientific management" took hold early in the 20th century—managers managed, workers worked, and the distinction between the two rarely was violated (Taylor, 1911). Manager-led groups continue to be seen today, not just in work organizations in which electronic technologies can facilitate continuous monitoring of team activities, but also for performing groups, such as a football team whose coach sends in every play or an orchestra whose players' only responsibility is to execute competently the conductor's instructions (Allmendinger, Hackman, & Lehman, 1996).

A *self-managing* group, in addition to its responsibility for executing the work, also has the authority to monitor and manage its own activities. This type of group has become prominent in organizations that seek to counter the dysfunctions of scientific management by fostering

member commitment to collective purposes (Cummings, 1978; Kirkman & Shapiro, 1997; Wall, Kemp, Jackson, & Clegg, 1986; Walton, 1985). It also is commonplace in professional work—for example, a team of research assistants that has the authority to manage data collection processes within constraints set by, and for purposes chosen by, the principal investigator. Groups created in the laboratory for experimental purposes generally are either self-managing or, when instructions are tightly scripted, manager-led.

Members of *self-designing* groups have the authority to modify the structure of the group itself or aspects of its context that affect group behavior. Although others specify the purposes of such groups, members themselves have full authority to do whatever needs to be done to get group purposes accomplished. Many leadership teams in organizations are self-designing, as are task forces of various kinds. A faculty committee given a charge to review the college's curriculum, for example, would be self-designing if members had the authority to change its own composition, perhaps by adding student members, or to alter aspects of its context, perhaps by instructing the registrar to provide enrollment data in a nontraditional format.

Finally, *self-governing* groups have authority to deal with all four of the functions listed earlier: Members decide about the group's purposes, structure the group and aspects of its context, manage their own performance processes, and actually carry out the work. Professional string quartets exemplify self-governing groups (Butterworth, 1990; Murnighan & Conlon, 1991), as do some legislative bodies, corporate boards of directors, volunteer community service groups, and worker cooperatives.

The level of a group's authority powerfully shapes both its internal dynamics and its relationships with those who create, manage, support, or are served by the group (Smith & Berg, 1987). The less powerful group members are relative to their leader or manager, for example, the more they exhibit passivity and obedience in their interactions (Ancona & Nadler, 1989). Authority dynamics rarely are explicitly acknowledged or discussed by group members, in part because it is anxiety-arousing to do so but also because many of those dynamics operate below the level of conscious awareness (Argyris, 1969; Bion, 1961). It is challenging, therefore, to empirically study authority dynamics in laboratory experiments or field studies that rely on standard research methodologies. Even though such dynamics clearly are present in those settings (for example, in the role and behavior of the experimenter in laboratory studies, or the manager in organizational settings), standard research methods are likely to capture only the surface manifestations of deeper and less accessible forces.

Because of these limitations, little is known about the differences in authority dynamics that characterize group interaction in manager-led, self-managing, self-designing, self-governing groups. Research in the psychodynamic tradition, to be discussed later in this chapter, suggests that these dynamics may be quite powerful in shaping what happens in groups that have different levels of authority. But as of this writing, bridges between the psychodynamic tradition and what has been learned from normal science studies of group behavior and performance remain to be built.

Type of Work

There is no shortage of research on groups that perform different kinds of work. To illustrate, here is merely a sampling of the different kinds of groups that have been the subject of empirical research:

- Groups that produce things, such as industrial work groups (Abramis, 1990), product development teams (Ancona & Caldwell, 1992b), and software development teams (Faraj & Sproull, 2000).
- Groups that provide services to people, such as medical care (Denison & Sutton, 1990), social and community support (Cline, 1999; Howell, Brock, & Hauser, 2003), and psychotherapy (Forsyth, 2001).
- Groups that decide things, such as juries (Hastie, Penrod, & Pennington, 1983; Kerr, Niedermeier, & Kaplan, 1999; Stasser & Davis, 1981; Tindale, Nadler, Krebel, & Davis, 2001), personnel selection teams (Tracy & Standerfer, 2003), and policy-making teams (Janis, 1982).
- Groups that provide organizational and institutional leadership (Edmondson, Roberto, & Watkins, 2003; Wageman, Nunes, Burruss, & Hackman, 2008).
- Groups that advocate and manage change, such as environmental advocacy groups (Ganz & Wageman, 2009), consulting groups (Sherblom, 2003), and organization development groups (Hackman & Edmondson, 2008).
- Groups that conduct research, such as intelligence analysis teams (Hackman & Woolley, in press) and scientific collaborations (Cummings & Kiesler, 2005).
- Groups that facilitate learning, such as classroom groups (Aronson & Patnoe, 1997; Johnson & Johnson, 1998) and student project teams (Druskat & Kayes, 2000; Gersick, 1990).
- Groups that mount performances, such as sports teams (Wood, 1990) and musical ensembles (Murnighan & Conlon, 1991).
- Groups that deal with adversarial or crisis situations, such as negotiating teams (Behfar, Friedman, & Brett, 2008), military teams (Salas, Bowers, & Cannon-Bowers, 1995), and crisis management teams (Klein, Ziegert, Knight, & Xiao, 2006).

We have learned a great deal about commonly-studied types of groups, such as juries, manufacturing and service teams, and temporary groups in the special context of the experimental laboratory. But much less is known about how the nature of a group's work affects either the character of group life or the emergent beliefs and attitudes of group members. It is one thing to do intellectual work with professionals, as leadership and consulting teams do, but quite another to put on a performance, to turn out an industrial product, or to engage an adversary in combat. The generalizability of findings from groups that do one kind of work to those that do different things remains mostly unexplored.

It is possible that comparisons across groups that perform different types of work would be at least as informative as comparisons involving the other attributes identified earlier—the degree of synchronicity in group interaction, the locus of responsibility for group outcomes, and the group's level of authority. It is unrealistic, however, to expect that many researchers will conduct research that explicitly compares groups that differ on these attributes. What *is* feasible is for researchers to include in their reports much more detail about the attributes of the groups they have studied than they typically do. That small innovation could greatly assist other scholars in assessing the generality of the findings obtained, and perhaps even prompt new insights about those attributes of groups that are of greatest consequence or conceptual interest.

A standard claim of cultural anthropologists is that any person is in some ways like all other people, like some other people, and like no other person (Kluckhohn & Murray, 1953). The same is true for groups: a particular group is in some ways like all others (which invites the development of general theory), like some others (which invites mid-range theory), and like no other (which invites case studies).

Case studies that focus on the "like no other" reality provide detailed accounts of specific groups but without reference to other groups of other kinds. They are valuable for teaching purposes, to be sure. But they also can provide deep understanding of particular groups that may be of special interest or importance and they can prompt ideas and hypotheses that would not have surfaced in the absence of detailed description.

The reality that all groups are like some other groups invites the development of mid-range theories that address the commonalities among all groups of a particular type, such as all juries or all industrial work teams. Because mid-range theories do not extend to groups of wholly different kinds, they can divert attention from generalities that actually *do* apply to all groups. That raises the third and most ambitious possibility: general theory that does purport to apply to all groups but that also includes "translation rules" to guide the application of the general-level constructs to particular kinds of groups and contexts. The clarity of a group's goals, for example, is just as meaningful for an open-source programming group as it is for an athletic team or an industrial work group—but its salience, manifestations, and potency surely vary across these settings. Empirical and conceptual work that explicitly addresses the translation from what is known about groups in general to groups of particular kinds could contribute substantially to the eventual development of *demonstrably* general models of group behavior and performance.

APPROACHES TO THE STUDY OF GROUPS

As suggested at the beginning of this chapter, group research is in a transitional period—the phenomena are changing as new group forms emerge, and the scholars who study them now come from a wider range of disciplines than ever before. It also is likely that new conceptual approaches will be required to develop robust understanding of the emerging new forms. If that is so, then it might be instructive to reexamine the scholarly approaches that have guided group research over the decades. Buried in that history are ideas and perspectives that, if taken off the shelf and inspected, could help guide contemporary scholars in further advancing research and theory about group behavior and performance (McGrath, 1997).

This section examines six distinct approaches to the study of groups that have been, or are now becoming, influential in small group research. They are: psychodynamic, network, action, process-focused, decision-analytic, and complex systems approaches. These six approaches are complementary lenses for understanding and studying groups. Each lens brings certain phenomena into sharp focus, yet can obscure other phenomena. Drawing on multiple lenses in analyzing a group, therefore, can generate a substantially more robust understanding than otherwise would be the case.

Other scholars have divided the research into some of the same, but also some different categories (e.g., Poole & Hollingshead, 2005; Wheelan, 2005). This section does not delve into the nuances of these different categorization schemes. Rather, the goal of this section is for each approach to provide a vivid depiction of its origins, to highlight important recent contributions, and to identify its distinctive strengths and prospects.

The Psychodynamic Approach

The psychodynamic approach to the analysis of groups focuses on social and emotional forces that are hidden

from view but that nonetheless can powerfully shape individual and group behavior. Although this approach draws heavily on psychoanalytic theories, it originated not with a Viennese analyst but with a French sociologist—Gustave Le Bon. In his book, *The Crowd: A Study of the Popular Mind* (1895/1995), Le Bon asserted that when individuals become part of a group, "the sentiments and ideas of all the persons in the gathering take one and the same direction, and their conscious personality vanishes" (p. 43). The mechanisms for this transformation, according to Le Bon, were heightened affectivity, suggestibility, and emotional contagion.

Le Bon viewed groups as more driven by instincts than individuals, and therefore less rational. He believed the capacity of a group to make wise decisions was always less than the capacity of its individual members. This was true for all groups—not just crowds but also elite groups vested with important decision-making authority. For example, even juries and parliamentary assemblies were, in Le Bon's view, incapable of exercising prudence and good judgment. Imposing democratic structures on such groups, he believed, would not tame their unruly instincts.

Le Bon's pessimistic views were reprised in the early 20th century by British psychologist William McDougall. In his book, *The Group Mind* (1920), written after his psychoanalysis with Carl Jung, McDougall described groups as:

> . . . excessively emotional, impulsive, violent, fickle, inconsistent, irresolute, and extreme in action, displaying only the coarser emotions and the less refined sentiments; extremely suggestible, careless in deliberation, hasty in judgment, incapable of any but the simpler and imperfect forms of reasoning; easily swayed and led, lacking in self-consciousness, devoid of self-respect and sense of responsibility, and apt to be carried away by the consciousness of its own force. (p. 64)

But McDougall did not share Le Bon's view that all groups were condemned to such a fate—only simple, unorganized groups were vulnerable. Organized groups, he asserted, could do better. He identified five conditions that could help in avoiding the worst aspects of group life: (1) a sense of continuity; (2) a sense of collective self consciousness; (3) specialization of functions among members; (4) interaction with other groups; and (5) group-generated traditions, customs, and habits.

Le Bon and McDougall greatly influenced Sigmund Freud's thinking about groups, who cited them approvingly in his essay, "Group Psychology and the Analysis of the Ego" (Freud, 1922/1959). In particular, he resonated with Le Bon's notion that unconscious motives can drive a group's behavior, but, following McDougall, he also asserted that "organization" can check a group's primitive instincts and enable it to operate rationally. For Freud, organization is to the group what the ego is to the id; it restrains primitive instincts so that the group becomes capable of coordination and control.

The first psychoanalyst to apply Freud's techniques to a group as a whole was Wilfred Bion, whose thinking had been shaped by his mentor and analyst, Melanie Klein. As an officer in the British Army during World War II, Bion accumulated considerable experience working with groups—he led therapy groups in a military psychiatric hospital and also introduced the "leaderless group" as a device for identifying those soldiers who would make the best officers (Bion & Rickman, 1943). From these experiences, he concluded that all groups oscillate between rational and irrational states. When in the rational state, the group is ruled by what Bion called the "work group," focused on the stated task. When in the irrational state, the group is ruled by any one of three "basic assumptions." The basic assumptions operate outside of awareness, but profoundly shape the group's behavior (Bion, 1952, 1961).

According to Bion, the first basic assumption ("dependence") is that the group leader is omniscient and omnipotent, and the group members need his or her protection. The group might resent feeling dependent and helpless but is determined to remain so. The second basic assumption ("pairing") is that the group's purpose is reproduction; the group will, at some future time, bring forth a messianic figure. The group is suffused with optimism. The third basic assumption ("fight or flight") is that the group's life is at risk, and the group faces a choice between battling or running away. The dominant emotion is fear. Only one basic assumption is in evidence at any one moment, but, over time, the group can veer from one assumption to another. These basic assumptions interfere profoundly with the effective functioning of the work group.

If a group is to function well, Bion argued, it must explicitly acknowledge these basic assumptions. When a group brings the basic assumptions into consciousness and consistently interprets them, they lose their destructive power. An essential aspect of competent group functioning, therefore, is to identify and acknowledge the influence of the basic assumptions and the strong emotions they foster so the energy of the basic assumptions can serve the work group.

A more recent exemplar of the psychodynamic approach is the work of Smith and Berg (1987) on the paradoxes of group life. Smith and Berg observe that groups are pervaded by a wide range of tensions that defy members' attempts at resolution and often spawn circular processes that block forward movement. The tensions and contradictions that members experience, Smith and Berg argue,

actually reflect true paradoxes—that is, both sides of the tension are simultaneously true. Among the paradoxes of group life they identify is the paradox of trust: "For trust to develop in a group, members must trust the group and the group must trust its members, for it is only through trusting that trust is built" (p. 641). The paradox of identity is "expressed in the struggle of individuals and the group to establish a unique and meaningful identity by attempting to indicate how each is separate from the other, while all the time turning out to actually be affirming the ways each is an integral part of the other" (p. 639). The paradox of authority is that "members must subordinate their autonomy to the group for it to become strong enough to represent members' collective interests; yet, in authorizing the group, members may diminish themselves and lessen the capacities of the group which derives its potency from the strength of its members" (p. 645). Not all group conflicts should be (or even can be) resolved, Smith and Berg argue, because when members think in terms of paradoxes rather than conflicts, it becomes clear that the tensions they are experiencing, although frustrating, are an integral aspect of group life.

Psychodynamic approaches continue to be seen in research on group dynamics, leadership, and intergroup relationships—although more as a trickle than a steady stream (e.g., Alderfer, 1987; Gillette & McCollom, 1990; Heifetz, 1998; Kets de Vries & Carlock, 2007). Psychodynamic constructs seem, on the whole, obsolete. Yet some of the assumptions that undergird the psychodynamic perspective are receiving new validation. Scholars increasingly recognize the power of emotional dynamics and implicit processes in shaping group behavior (Clark & Sline, 2003; McLeod & Kettner-Polley, 2005). Moreover, research on intergroup perceptions using the Implicit Association Test (Nosek, Greenwald, & Banaji, 2007) suggests that forces of which group members are wholly unaware can nonetheless profoundly affect what happens in groups (Dovidio, Kawakami, & Gaertner, 2002).

The Network Approach

The network approach to understanding group behavior, which charts and analyzes the relationships among group members, both complements and contrasts with the work of psychodynamic scholars. It is complementary in that it also focuses on emotions and the affective bonds among people. It departs from the psychodynamic tradition, however, by attending mainly to members' explicit, conscious feelings about one another. Jacob Levy Moreno, the founder of this approach, captures that difference in describing his first meeting, as a young man, with the much-older Sigmund Freud: "I said [to Freud], I start where you leave off. You meet people in the artificial setting of your office. I meet them on the street and in their homes, in their natural surroundings. You analyze [people's] dreams. I give them the courage to dream again" (Marineau, 1989, p. 30).

Moreno invented the term, the concept, and the methodology of *sociometry*, which captures what he referred to as "the flow of feeling and sentiment" among group members. Moreno's methodology consisted of first surveying all the members of a group to determine their feelings about one another. This would show whether the affect between each member and every other member was positive or negative, and whether that sentiment was one-way or mutual. He then would create a diagram of the group. Each group member would be a node in the diagram, and the lines connecting nodes would represent the ties—positive or negative, uni- or bi-directional—between members. The resultant sociogram revealed what he called the group's depth structure as opposed to its formal structure.

The sociogram was a useful tool for operationalizing group-level constructs (Moreno, 1934, 1943). For example, when the sociogram revealed many mutual positive ties among group members, the group showed high "cohesion." When the network ties formed complex structures, such as chains, triangles, or squares, the group showed high "integration." When there were many mutual repulsions and one-way attractions, the group exhibited "disorganization and disharmony." Moreno applied this technique not only to relationships between individuals in a group, but to relationships between groups and to relationships between individuals and groups.

By tracking the changing pattern of network ties in a group or a society (which he called *sociodynamics*), Moreno believed he could predict many important phenomena, including the type of leadership that would emerge (democratic versus autocratic), the level of morale, the emergence of cliques, the alienation of minority groups, the spread of public opinion, and the distribution of wealth and power. Moreover, he asserted that the extent of the discrepancy between a group's formal social system and its sociogram determined the level of instability and conflict in the group (Moreno, 1934).

Moreno's writings convey an exuberant sense of possibility for what sociometry could contribute to understanding and improving group behavior. He dreamed of a future society in which every group's formal structure would mirror its depth structure, with all people free to join and leave groups as they wished. Under those conditions, every group would be a setting in which creativity and spontaneity were unleashed (Nehnevajsa, 1955). Sociometry thereby could provide "the cornerstone of a still undeveloped science of democracy" (Moreno, 1941, p. 35), which turned out to be a prescient aspiration given the increasing

use of electronic technologies to create and deploy social networks in pursuit of democratic ideals (Noveck, 2009; Shirky, 2008).

The sociometric approach found a highly receptive audience in Kurt Lewin, and the journal Moreno founded, *Sociometry*, became the venue for a number of classic studies by Lewin and his colleagues on the social psychology of group behavior (e.g., Lewin & Lippitt, 1938; Lewin, Lippitt, & White, 1939). As early as 1935, Lewin had concluded that the study of groups had reached an impasse and would not realize its value if it continued to focus on purely descriptive analysis. Because Lewin viewed the rigorous, systematic nature of sociometry as a way to illuminate causal relationships through experimental methods, he adopted sociometric techniques for use in his own research.

In 1945, Lewin established the Research Center for Group Dynamics at MIT. The center was devoted to conducting controlled experiments in both laboratory and field settings (Lewin, 1945). The center became an intellectual incubator in which Lewin and his mentees designed imaginative studies of group communication (e.g., Bavelas, 1950; Guetzkow & Gyr, 1954; Guetzkow & Simon, 1955; Leavitt, 1951; Leavitt & Mueller, 1951) that generated hundreds of published articles (Monge & Contractor, 2003).

The early method for studying social networks at the Research Center for Group Dynamics was as follows: Study participants were randomly assigned to seats at adjoining cubicles. Participants could not see one another but could slip written messages to select others through slots in the walls. The researchers constrained who could pass notes to whom, thereby manipulating the pattern of ties and flow of information. Researchers compared the impact of various network configurations (e.g., circle, chain, y, wheel, and all-channel) on group functioning and performance.

After a flurry of early studies, the network approach to studying small groups became dormant from the 1960s through the 1980s. In the last fifteen years, however, this approach has resurfaced with renewed vigor, in part because of the availability of sophisticated software that quantifies key network features and creates visual displays of network patterns. Here is a sampling of findings that illustrate the kinds of things that can be learned from network studies. Groups with more internal ties outperform groups with fewer ties (Baldwin, Bedell, & Johnson, 1997; Reagans & Zuckerman, 2001). Teams with complex tasks perform better if their internal network is relatively decentralized (Sparrowe, Liden, Wayne, & Kraimer, 2001). The internal and external friendship ties of team leaders predict team performance (Mehra, Dixon, Brass, & Robertson, 2006).

Perhaps the greatest strength of the network approach is that it enables researchers to bridge the divide between a group's internal processes and its external context (Katz, Lazer, Arrow, & Contractor 2004, 2005). With newly available technologies and analytic methods, the approach is now so powerful that network methods may soon become indispensable in social research. As Lazer and colleagues (2009) note, people now leave an enormous number of "digital traces" in their wake every day. By applying network methods to this vast aggregate of data, researchers now can study social processes, including the dynamics of widely distributed groups, at a level of detail never before possible.

The Action Approach

The action approach involves the development and use of group methods specifically to achieve positively valued outcomes. It seeks simultaneously to solve practical problems and to discover general laws of group life (Peters & Robinson, 1984). Typically, the approach involves a spiral process of data collection, feedback of results, and then more data collection—involving throughout, close collaboration with the people being studied.

Action research is most closely identified with Kurt Lewin who, in an early issue of the *Journal of Social Issues*, called on his colleagues to commit themselves to research in which "the diagnosis has to be complemented by comparative studies of the effectiveness of various techniques of change. Research that produces nothing but books will not suffice" (Lewin, 1946/1948, p. 203). Lewin's advocacy of action research was not merely an intellectual interest; it was driven by the profound anti-Semitism he witnessed and experienced while growing up Jewish in Europe. According to his social psychologist daughter, after learning that his mother, aunt, and cousins all had been killed in Nazi concentration camps he resolved to devote the rest of his career to conducting research that would directly combat bigotry and discrimination (Lewin, 1992).

Lewin not only coined the term *action research* but also was a pioneer in conducting it. In explaining why he relied on group methods in his action research projects, Lewin (1947a) wrote:

> Experience in leadership training, in changing of food habits, work production, criminality, alcoholism, prejudices, all seem to indicate that it is usually easier to change individuals formed into a group than to change any one separately. As long as group values are unchanged the individual will resist changes more strongly the farther he is to depart from group standards. If the group standard itself is changed, the resistance which is due to the relation between individual and group standard is eliminated. (p. 34)

One of Lewin's first action research projects was a two-week workshop, conducted in the summer of 1946 with

his colleagues from the MIT Group Dynamics Research Laboratory, on behalf of the Advisory Committee on Race Relations of the State of Connecticut. The goal was to enhance the skills of teachers and social workers in dealing with interracial issues, and the primary methodology was small group discussion and role playing. Participants described problems in race relations that they were facing back home and then practiced alternative ways of understanding and dealing with those problems.

The experimental manipulation was based on Lewin's three-step model of change. Step 1 is "unfreezing": Confronted with a dilemma or a disconfirmation of existing beliefs, an individual or group becomes aware of a need for change. Step 2 is "changing": Participants experiment with new ways of behaving. Step 3 is "freezing": The new behavior is evaluated, and if positively reinforced, incorporated into the individual's or group's repertoire. Lewin predicted that those participants who came to the workshop in intact groups from their communities would show greater and more permanent attitudinal and behavioral change than those who came as individuals, thereby affirming the power of the group as a tool for social change.

At the end of the workshop's first day, the research team met to review members' notes and listen to audiotapes of the sessions. To the dismay of the rest of the research team, Lewin invited participants also to sit in on the debriefing. What transpired as participants discussed their behavior and its consequences galvanized everyone present. Here is how Benne (1964) subsequently described the process:

> A research observer might report [from his notes]: At 10:00 A.M. Mrs. X attacked the group leader. Mr. Y came to the defense of the leader, and he and Mrs. X became involved in a heated exchange. Some other members were drawn into taking sides. Other members seemed frightened and tried to make peace. But they were ignored by the combatants. At 10:10 A.M., the leader came in to redirect attention back to the problem, which had been forgotten in the exchange. Mrs. X and Mr. Y continued to contradict each other in the discussion that followed.
>
> Immediately, Mrs. X denied and Mr. Y defended the accuracy of the observation. Other members reinforced or qualified the data furnished by the observer. In brief, participants began to join observers and training leaders in trying to analyze and interpret behavioral events. . . . Participants reported that they were deriving important understandings of their own behavior and of the behavior of their groups. To the training staff it seemed that a potentially powerful medium and process of reeducation had been, somewhat inadvertently, hit upon. (p. 82)

This experiment—in particular what happened during the informal debriefing sessions—led to a follow-up series of group workshops at the National Training Laboratory in Bethel, Maine. The Bethel groups were called "basic training groups" ("T-groups" for short). T-groups had multiple purposes: (1) to deepen participants' understanding of group dynamics and development; (2) to develop participants' skill in facilitating group effectiveness; (3) to increase participants' insight into themselves and their impact on others; (4) to provide an opportunity to experiment with new behaviors; (5) to enhance participants' ability to give and receive feedback; and (6) to make constructive use of conflict.

To achieve these aspirations, groups focused on members' thoughts, feelings, and behaviors as they occurred and were experienced in real time. Moreover, they were expected to learn how to engage fully in the group emotionally while simultaneously cultivating an analytic detachment that would allow them to learn from their feelings (Yalom, 1995). T-groups became extremely popular in the 1960s and 1970s as a form of management training and development and provided the foundation for the field of organization development. Offshoots of T-groups, such as sensitivity training and encounter groups, spread beyond industry to the wider culture.

As the years passed, interest in T-Groups began to wane, in part because the lessons participants learned on the "cultural island" that the groups provided tended not to persist in their back home environments. This development was especially troublesome to social psychologist Chris Argyris, who had been a leader in the T-Group movement and who, like Lewin, had great faith in the power of small groups as a crucible for individual change (Argyris, 1964).

Argyris eventually concluded that participants' default assumptions and values about social behavior were too strong to yield even to well-designed and well-led T-Group training. Specifically, he came to believe that behavior in groups is governed by the overriding goals of controlling the task, maximizing winning and minimizing losing, and avoiding embarrassment and threat. Rather than share valid data, Argyris concluded, people keep their true thoughts and feelings to themselves. Rather than test their assumptions and attributions, people discourage honest feedback from others. Disagreement is covered over, and a façade of pleasantness and politeness obscures what is really going on. Moreover, the cover-over is itself covered over. As a result, no one learns anything that is personally meaningful or useful in the wider world.

The only escape from this dead end, Argyris argued, was action research that departs radically from conventional social science. Whereas normal science strives to be objective and value-neutral, he concluded, action research

must be normative and prescriptive (Argyris, Putnam, & Smith, 1985). The ultimate goal of action research, then, would be to develop a group's capacity for what Argyris calls *double loop learning*—that is, the capability not just to regulate behavior to achieve one's goals but to explore the validity of the goals themselves.

In recent years, scholars continue to explore how best to achieve ambitious objectives, such as those set forth by Lewin and Argyris, even as they draw on the methods and values of action research to pursue other scholarly objectives—from ways to use large groups to create systemic change in organizations or communities in real time (Bunker & Alban, 2006) to the development of group methods for carrying out planned organizational change programs (Hackman & Edmondson, 2008).

Perhaps the greatest overall strength of the action approach is the value it places on collaboration between those who conduct the research and those who participate in it. Researcher–participant collaboration helps keep action research focused on issues that have practical as well as scholarly significance. The risk, however, is that findings from such studies will be relegated to organization development journals rather than mainline academic journals—in which case the action research paradigm could become even more intellectually marginalized than it is now, lose its academic credibility, and fail to have the level of impact to which its founders aspired.

The Process-Focused Approach

> In the early days of "group dynamics," when therapists such as Wilfred Bion reported addressing their groups with interpretations that lumped all participants together, by saying "the group is" (doing or feeling so and so, such as "pairing" or "in flight"), the hair on the back of my neck always bristled in indignation as I read Bion's interpretation. In . . . groups I was always attuned to individual differences and interaction between different individuals and different value positions. I always made a point of looking for dissidents whenever a majority seemed to be forming. And I nearly always found them, even if there was only one of them, back in a corner or looking longingly toward the door. . . . (Bales, 1999, p. 115)

Thus wrote R. Freed Bales, whose system for analyzing group interaction launched the process-focused approach to understanding group behavior and performance. In his early work, Bales showed little interest in, or sympathy for, psychodynamic interpretations, or group members' self-reports about who they did and did not like, or action research that sought to alter how members thought, felt, or behaved. Instead, he set out to chart—concretely, reliably, and in detail—what actually transpires in group interaction (Bales, 1950). It is that insistent focus on group interaction that is the essence of the process-focused approach to the study of groups.

Bales' particular methodology for assessing group interaction, Interaction Process Analysis (IPA), is a detailed coding system that breaks group interaction into its smallest constituent units, which he called "communication acts." For each act, trained observers record who performed the act, to whom it was directed, when it occurred, and the function it served. With those data in hand, researchers can then document how group members gradually develop distinctive roles, how alliances crystallize into subgroups, how the character of interaction changes over time, and more. Although labor intensive, IPA was so informative about group interaction that it became the standard method for coding group interaction throughout the last half of the 20th century (Forsyth & Burnette, 2005).

The IPA framework grew out of the work of Bales' mentor, sociologist Talcott Parsons. Parsons was perhaps best known for his theory of functionalism, which explains the evolution of societal structures such as economic, legal, and educational institutions in terms of the human needs they fulfill. Bales extended Parsons' theory of functionalism from the level of society to the level of the small group. Specifically, Bales posited that there are certain fundamental issues that every group must resolve. Some of those issues are in the task domain, and some are in the socioemotional domain. In the task domain are the challenges of orientation (developing a shared understanding of the task), evaluation (identifying which ideas to accept and which to reject), and control (keeping the group moving forward). In the socioemotional domain are challenges of decision (how members show agreement and disagreement), tension reduction (for example, by using humor), and reintegration (showing solidarity and support).

Bales found that the task and socioemotional needs of a group are in conflict. Because making progress on the task necessarily produces relational strain, a group needs to establish equilibrium through a cyclic pattern of interaction, with forward movement on the task followed by socioemotional communication that restores interpersonal harmony. He also documented the problems that arise when acts in one category are not balanced by acts in a complementary category. For example, conflict is likely to emerge when "giving opinions" is not balanced by "asking for opinions."

The list of substantive findings obtained using interaction process analysis is long. For example, two leaders typically emerge in a group, one who focuses on the task domain and the other on the socioemotional domain. The larger the group, the more likely one person will dominate.

Most acts in small groups are task-oriented rather than socio-emotional. In order to successfully accomplish its task, a group needs more positive than negative communication acts. Newly formed groups progress through a predictable sequence of phases in problem solving: evaluation, orientation, and control (Bales & Strodtbeck, 1951; Seeger, 1983).

As informative as interaction process analysis has been about what actually happens in groups, it generated relatively few findings about what might be done to improve group functioning. Eventually, Bales developed a new model, based on the over five decades of work using IPA, that did have a more normative character. This model, known as SYMLOG ("systematic multiple level observation of groups") draws on multiple sources of data to generate a plot that situates each group member in three-dimensional space: dominant versus submissive, friendly versus unfriendly, and instrumentally controlled versus emotionally expressive (Bales & Cohen, 1979). That plot, which also depicts subgroups and their location in the three-dimensional space, provides an empirical basis for interventions intended to improve group interaction and performance.

In recent years, researchers in the process-focused tradition have been giving increasing attention to the ways patterns of interaction eventually generate stable group structures—a process known as *structuration* (Poole, Seibold, & McPhee, 1985). Structuration explains why groups that have an identical objective situation often carry out their work quite differently (Orlikowski, 2000; Perlow, Gittell, & Katz, 2004). To illustrate, consider the structure of a group's task. Members' work on that task is shaped not only by the objective task structure but also by their own preferences and values about working together. As Wageman and Gordon (2005) have shown, when members share egalitarian values, they are more likely to approach a task as a highly interdependent endeavor, but when they share meritocratic values, they are more likely to approach the same task as a low interdependence activity. Over time, these emergent behavioral patterns become normative and solidify into an aspect of the group's structure.

Overall, the major strength of the processed-focused approach is its capacity to capture nuance and meaning and to produce a rich and data-based understanding of how group members interact. Its major limitation is that generating process-focused descriptions of group interaction is an extremely labor-intensive undertaking. As hardware and software are developed to automate the coding of interaction processes, it is at least possible that the field of small group research will see a resurgence of interest in Bales-type process analyses.

The Decision-Analytic Approach

The decision-analytic approach to studying groups has two distinct research streams. The first stream has its origins in qualitative, case-based methods. The second stream is highly quantitative and largely laboratory-based. Despite these differences in methods, the streams share two key assumptions. One is that the purpose of using a group rather than individuals for decision making is primarily to enhance decision quality. The second is that variations in the quality of group decisions generally can be attributed to the quality of group interaction (Wittenbaum et al., 2004).

The qualitative stream of research originated with the work of Irving Janis with the publication in 1972 of his book, *Victims of Groupthink*. Though Janis was trained as a social psychologist, his method for studying groupthink, comparing case studies drawn from American history, was atypical of most of the social psychological research being conducted at that time. In the introduction to the second edition of the book, he explains how he found himself in that territory:

> The main theme of this book occurred to me while reading [historian] Arthur M. Schlesinger's chapters on the Bay of Pigs in *A Thousand Days*. At first, I was puzzled: How could bright, shrewd men like John F. Kennedy and his advisers be taken in by the CIA's stupid, patchwork plan? I began to wonder whether some kind of psychological contagion, similar to social conformity phenomena observed in studies of small groups, had interfered with their mental alertness. I kept thinking about the implications of this notion until one day I found myself talking about it, in a seminar of mine on group psychology at Yale University. (1982, p. vii)

Janis presented seven detailed case studies in his book, ranging from the decision in 1941 by Admiral Kimmel and his advisors to focus on training rather than on the defense of Pearl Harbor despite signs of an impending attack by Japan to the well-known decision in 1960 by President Kennedy and his advisers to invade Cuba at the Bay of Pigs. Especially well known is the contrast between the Kennedy group's Bay of Pigs fiasco and essentially the same group's successful management of the Cuban missile crisis two years later.

Janis constructed the case studies mainly from secondary sources: minutes of group meetings, diaries, memoirs, letters, prepared statements given to investigating committees, and published documents. These data provided the basis for his model of groupthink, which he specifically defined as "a mode of thinking that people engage in when they are deeply involved in a cohesive ingroup, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action" (1982, p. 9).

Janis took pains to make clear that he believed in the potential of groups as effective decision-making units:

> I do not mean to imply that . . . group decisions are typically inefficient or harmful. On the contrary, a group whose members have properly defined roles, with traditions and standard operating procedures that facilitate critical inquiry, is probably capable of making better decisions than any individual in the group who works on the problem alone. And yet the advantages of having decisions made by groups are often lost because of psychological pressures that arise when the members work closely together, share the same values, and above all face a crisis situation in which everyone is subjected to stresses that generate a strong need for affiliation. (1982, p. 12)

The primary strengths of the groupthink model are its clarity, richness, and persuasiveness. Moreover, as Baron (2005) notes, the model offers a broad array of testable hypotheses since Janis carefully delineated the antecedents of groupthink, the symptoms exhibited by a team that is in its throes, and the consequences that follow. For these reasons, a great deal of empirical work has been carried out to test the model (e.g., Esser & Ahlfinger, 2001; Neck & Moorhead, 1992; Tetlock, Peterson, McGuire, Chang, & Feld, 1992) as well as to assess alternative models of groupthink-like phenomena (e.g., Baron, 2005; Kramer, 1998; McCauley, 1998; Raven, 1998; Turner & Pratkanis, 1998; Whyte, 1998). Baron (2005) offers this summary appraisal: "A review of the research and debate about Janis's model leads to the conclusion that after some 30 years of investigation, the evidence has largely failed to support the formulation's more ambitious and controversial predictions. . ." (p. 219).

Despite the decidedly mixed evidence about the validity of the model, it survives and, for the most part, prospers. Textbooks continue to discuss the groupthink model in detail, and it commonly is invoked to explain contemporary group decision-making fiascoes, ranging from the launch of the space shuttle *Challenger* to the Reagan administration's Iran–Contra scandal (Kramer, 1998, p. 238). What accounts for the resilience of groupthink? Clearly, the quality of Janis's writing and his skilled use of case studies play a role—in part because the cases invoke the *availability heuristic* (Aldag & Fuller, 1993). But perhaps most significant is the fact that his hypothesis is counterintuitive for most readers—that is, something people usually think of as good (group cohesiveness) can actually be quite dangerous. Together, these factors have rendered the groupthink hypothesis relatively immune to empirical correction, as badly needed as such corrections have turned out to be.

The second stream of research in the decision-analytic tradition is largely laboratory-based. In the 1960s and 1970s, this stream analyzed the ways group members combine their initial preferences to achieve a consensus position—for example, in jury decision making. More recently, this stream has emphasized the combination of members' information or expertise rather than their simple preferences (Kerr & Tindale, 2004).

Research on social combination models (e.g., Davis 1969, 1973; Kerr, 1981; Laughlin, 1980; Penrod & Hastie, 1981; Shiflett, 1979; Stasser & Davis, 1981) seeks to predict how group members will combine their diverse individual preferences into a single group response. The basic research paradigm requires a group to reach consensus regarding two or more prespecified alternatives (e.g., guilty versus not guilty). The inputs to the group decision are each group member's preference prior to group discussion, with group process simulated through alternative social combination models. Each way of resolving disagreement is represented probabilistically by a different decision rule for reaching consensus, such as voting, turn taking, demonstration, random selection, and the generation of a new alternative. According to Laughlin and Hollingshead (1995), voting can be represented as a majority wins model. Turn taking can be represented as a proportionality process. Demonstration can be represented as a truth wins or truth-supported wins model. Random assignment can be represented by a model that assigns equal probability to any alternative advocated by at least one group member. Researchers compare the actual proportion of groups selecting each decision rule with the proportion expected based on the initial distribution of individuals' preferences.

The type of model that best explains the data turns out to depend heavily on the type of group task being performed. For judgment tasks that have no demonstrably correct answer, majority models best predict the probability of the group choice, for example. For intellective tasks for which a demonstrably correct response exists, truth wins or truth-supported wins models best predict the probability that a group will select the correct answer. But, there is a twist: Unless at least one member advocates an alternative prior to the group discussion, that alternative is rarely even considered by the group and has almost no chance of being selected (Hollingshead, 1996; Laughlin, 1999).

Another line of research in the decision-analytic tradition focuses on how group members share information as they come to a decision or generate the solution to a problem. One benefit of group decision making is that the pooling of information held by different members can result in a more informed decision than otherwise would be the case. But, as demonstrated in a classic paper by Stasser and Titus (1985), groups actually tend to discuss only information that is shared by all members, rather than pieces of

information that are uniquely held by single individuals. This phenomenon can compromise the group product both when the information most needed is held by a single individual and when many individuals have separate pieces of information that must be surfaced and integrated for the group to come up with the optimal course of action. As will be discussed later in this chapter, numerous scholars have explored the conditions that increase the likelihood that a group actually will elicit and use appropriately information that is uniquely held by individual members.

The quantitative, laboratory-based stream of research on group decision making is distinguished both by its formal elegance and its predictive power, especially for well-defined tasks such as jury decision making. Relative to qualitative research on group decision making, however, this line of research does not capture the substantive richness of what goes on in groups as members wrestle with difficult decisions—and, therefore, it can come across as relatively dry. Current developments in neuroscience offer new possibilities for exploring some intriguing parallels between groups and brains (Hinsz, Tindale, & Vollrath, 1997), as well as for the conduct of cross-level research on the ways that individual neural processes come to be assembled, through group interaction, into collective decisions.

The Complex Systems Approach

Many decades ago, Kurt Lewin conceptualized groups as holistic and dynamic systems, but at that time the tools needed to conceptually and empirically explore that view were not available. By the mid-1990s, complexity theory seemed to provide both a language and a methodology for bringing that approach to bear on group behavior (Wheelan, 1996).

Joseph McGrath and his colleagues at the University of Illinois took on the challenge of doing so. They had grown increasingly dissatisfied with established methods for studying and conceptualizing group process, for several reasons (McGrath, 1997; McGrath, Arrow, & Berdahl, 2000). First, groups typically were treated as simple systems, composed of chain-like, unidirectional cause–effect relationships. Second, the context in which groups were embedded often was ignored. Third, groups were studied as static entities, without a past or future. And fourth, groups were treated as generic entities, composed of generic people. The Illinois group sought an alternative approach, one that would be less mechanistic and more true to their own experience of group process as a sometimes baffling but always rich mix of routine and surprise, predictability and randomness, the obvious and the obscure. They turned to complex systems theory for that alternative approach.

Complex systems theory is an increasingly popular perspective emerging from work in biology, physics, mathematics, and computer science (Mathews, White, & Long, 1999). As McKelvey (1999) asserts, the study of complex adaptive systems "has become the ultimate in interdisciplinary science, focusing its modeling activities on how microstate events, whether particles, molecules, genes, neurons, human agents, or firms, self-organize into emergent aggregate structures" (p. 5). The basic premise of complexity theory, according to McClure (1998), is as follows: Even though the behaviors of natural systems are not predictable, there are patterns to their randomness or irregularity. Those patterns emerge over time. The aspiration is to track the patterns, both linear and nonlinear; to identify the contingencies that shape them; and to predict the exceptions or deviations from them.

Drawing on these few ideas, McGrath, Arrow, and Berdahl (2000) articulated a new approach to thinking about groups:

> We see groups as complex, adaptive, dynamic systems. Rather than simple, groups are complex entities embedded in a hierarchy of levels and characterized by multiple, bidirectional, and nonlinear causal relations. Rather than isolated, groups are intricately embedded within and have continual mutual adaptation with a number of embedding contexts. Rather than static, groups are inherently dynamic systems, operating via processes that unfold over time, with those processes dependent both on the group's past history and on its anticipated future. (p. 98)

A group is best understood, then, as a complex system made up of individuals who are themselves complex systems, each guided by goals and perceptions that change over time. Each individual belongs to multiple groups at the same time, and these groups are embedded in physical, temporal, sociocultural, and organizational contexts.

The distinctions among local, global, and contextual dynamics are central to the complex systems approach to understanding group behavior. Local dynamics involve the activity of group members and their links to tools and resources to accomplish tasks. Local elements interact with one another in a recursive, nonlinear way, and they cannot be meaningfully decomposed into standard independent and dependent variables (McGrath, Arrow, & Berdahl, 2000, p. 99). The pattern of interaction among local variables generates global variables—emergent aspects of the system, not mere aggregates of local variables—such as norms, cooperation, conflict, and leadership. Moreover, the higher level order that gradually emerges from the chaotic activity of lower level components cannot be fully specified from a detailed understanding of isolated system

components. Thus, as Arrow (2005) notes, this approach requires "an appreciation for the paradox of coherent patterns arising out of group behavior that remains unpredictable in its particulars" (p. 202).

Contextual dynamics refer to the impact of system-level parameters whose values are determined in part by the group's embedding context, such as the level of organizational support, the supply of potential members, and the demand for group outputs. The interplay between micro and macro system levels operates in both directions: global variables emerge from local actions but then guide and constrain those same actions. Conventional methods of studying groups are not of much help in sorting this all out. When the elements of a system are strongly and complexly interconnected, for example, it is not useful to decompose that system into its basic elements and then attempt to vary them one at a time to assess their independent effects. In complex systems, the links are as important as the elements, and there are more of them. The focus of research, then, should be on identifying the rules that guide the interactions among variables rather than trying to predict the specific future values of particular variables (Arrow, McGrath, & Berdahl, 2000, p. 46).

A number of researchers have attempted to carry out empirical analyses of small groups as complex systems, including Arrow (1997), Arrow and Burns (2004), Arrow and Crosson (2003), Fuhriman and Burlingame (1994), Guastello (2007), Guastello and Guastello (1998), and Wheelan (1996), sometimes using computational modeling to analyze the dynamics of such systems (Berdahl, 1998). Yet research on group behavior using a complex systems approach has not yet become mainstream, perhaps because the approach poses difficult conceptual challenges and requires use of methodologies that are unfamiliar to most small group researchers. It also may be that the promise of the approach initially was oversold to some extent. As Cohen (1999) has pointed out:

> . . . we need to begin sharpening our appraisal of the promise and limitations of complex systems theories . . . To have real value, such new ideas cannot for very long be characterized as the potential answer to almost every question. A period of testing their applicability across a spectrum of issues is needed. This will help us to determine on which problems the ideas work best, and which are best attacked with other tools. (p. 373)

The period of testing is not yet over. But findings thus far suggest that the main contribution of the complex systems approach may lie in its potential for generating sophisticated answers to the question: What are the factors and conditions that influence group change and development over time? Other questions about small groups, perhaps, will continue to be most appropriately addressed using other tools. In Arrow's (2005) words, "Work in this perspective is in an early stage of development. We are, in the terminology of the field, working far from equilibrium at the edge of chaos, a state in which creativity and disorganization are both readily available" (p. 202).

CURRENT FRONTIERS OF GROUP RESEARCH

The current flowering of research on purposive groups is generating a number of shoots that extend off into some new empirical and conceptual directions—some of which, as will be seen, have their roots in the intellectual history of the approaches just reviewed. This section explores several specific issues for which contemporary group research appears to be especially productive, promising, or problematic.

Assembly of Member Attributes

In an early review of research on group performance, Collins and Guetzkow (1964) coined the term "assembly effect" to refer to cases in which a group achieves collectively something beyond what could have been achieved by any of its members or by a simple combination of what members bring to the task. An example would be a group decision that is neither the average of individuals' preferences nor the adoption of the prior position of certain members. Although Collins and Guetzkow focused mainly on group performance, the idea of the assembly effect can be applied to any circumstance in which the attributes of individuals come together to create a genuinely *collective* reality. To illustrate, researchers have studied the assembly of members' emotions (Barsade, 2002), motivation (Chen & Kanfer, 2006), self-efficacy (Tasa, Taggar, & Seijtz, 2007), cognitions and concepts (Laughlin, 1999), skills and capabilities (Kozlowsiki, Gully, Nason, & Smith, 1999), social values (Wageman & Gordon, 2005), and personal dispositions and styles (Moynihan & Peterson, 2001).

Group polarization—that is, the tendency to settle on a riskier or more conservative position after group discussion—often is described as if it were an assembly effect (Brown, 1986, Isenberg, 1986). But the great majority of studies of polarization processes actually assess only changes in the level of risk that *individuals* are willing to accept after having discussed their choice with others. Research on group polarization has been more about the impact of group discussion on privately expressed individual preferences than about a genuinely group-level shift.

The attempt by numerous group researchers to generate and study the group-level manifestations of individual-level states, attributes, and processes raises two questions. One, how do assembly processes unfold and what do they generate? And two, which aspects of individuals can be assembled into group-level constructs, and which cannot or should not be?

A number of scholars have addressed these questions. Moreland, Levine, and Wingert (1996) provide a general model of group composition effects, with special attention to how "chemistry" develops in a group. Felps, Mitchell, and Byington (2006) present a model of how the ripples set in motion by troublesome individual members (i.e., "a bad apple") can alter the dynamic of the group as a whole. Kozlowski and his colleagues (Kozlowski, Gully, Nason, & Smith, 1999; Kozlowski, Watola, Nowakowski, Kim, & Botero, 2009) describe the way in which performance processes compile over time and the role of team leaders in facilitating that process. Goldstone, Roberts, and Guerckis (2008) draw a parallel between how neurons interconnect in the brain and how members' interactions result in emergent group processes such as bandwagon effects and population waves. Some researchers have gone even further, adopting the concept of a "group brain" quite literally, asserting that cognition happens not just at the individual level but also at the level of the group as a whole (Larson & Christensen, 1993).

Contemporary Models of Collective Cognition

Collective-level cognitive constructs have achieved considerable currency in contemporary group research and theory (Forbes & Miliken, 1999; Hinsz, Tindale, & Vollrath, 1997). The most prominent of these is the concept of *transactive memory*, developed by Daniel Wegner (Wegner, 1986, 1995; for a review of research on the construct, see Peltokorpi, 2008). Wegner posited that groups, like individuals, have memory systems that collect, encode, store, and retrieve information. Over time, different members of a group come to keep track of different matters, which results in the group as a whole having access to more information than any single individual—transactive memory.

Group members who spend time working together also can develop a *shared mental model*, a related concept that also brings what is known about individual cognition to the group level of analysis (Cannon-Bowers, Salas, & Converse, 1993; Klimoski & Mohammed, 1994; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). A mental model is a cognitive representation of how some system operates. When group members share the same mental model, coordination is enhanced and the likelihood of miscues is lessened (Ensley & Pearce, 2001; Waller, Gupta, & Giambatista, 2004).

A third collective construct is *collective mind*, which, as set forth by Weick and Roberts (1993), focuses more on cognitive activities than on the mind as an entity: "Our focus is at once on individuals and the collective, since only individuals can contribute to a collective mind, but a collective mind is distinct from an individual mind because it inheres in the pattern of interrelated activities among many people" (p. 360). Collective mind is explicitly social in character because it derives from what Weick and Roberts call "heedful interrelating" among members. The more attentively members interact, the more robust their collective mind will be.

Interpretive Cautions

Group-level cognitive constructs are not without interpretive risks, and the present day is not the first time they have been encountered. Early in the 20th century, William McDougall published *The Group Mind* (1920), which laid out the principles of what he called "collective psychology." The book prompted a blistering response from Floyd Allport (1924). Allport flatly rejected any notion of social cognition, emotion, or behavior, and asserted that McDougall had fallen victim to the group fallacy: "[T]he individual in the crowd behaves just as he would have alone, only more so. . . . There is no psychology of groups that is not essentially and entirely a psychology of individuals" (p. 4).

Although both McDougall and Allport may have stated their cases more vigorously than absolutely necessary, the study of assembly effects is in fact a risky and challenging undertaking. There is, of course, no problem with group-level properties that exist *only* at the collective level—for example, compositional features such as group size or the demographic diversity of members, and structural features such as group norms (whose conceptualization, following Jackson, 1966, centrally involves the variance among members, and variance is meaningful only at the collective level). Group properties that are obtained by aggregating the attributes or behaviors of individual members, however, require interpretive caution. To illustrate, the aggregated property of "group height," obtained by averaging the heights of all members, would seem to make no sense at the group level since only individuals can be tall or short. But, in the context of basketball, the concept becomes meaningful—some teams are indeed "taller" than others.

Aggregated properties often are established when a group is formed (e.g., the overall level of member skills), but they also emerge as a product of members' interactions (e.g., in the enhancement of collective talent as members learn from one another or in the development of a collective point of view about some matter). In either case, group

scholars are obligated to establish that the aggregated property has both conceptual meaning and empirical integrity at the group level of analysis (Hackman, 2003; Walsh, 1995).

Concepts that describe group *processes* are more theoretically challenging than those that describe group properties. Descriptors of group decision making, task-performance activities, or learning processes pose no special problems because those processes generate outcomes that can be unambiguously attributed to the group as a collective—that is, a decision, a product, or alterations in how members work together. Difficulties arise, however, when collective processes are described using concepts whose actual referents are the biological, cognitive, or affective functioning of individual persons. It is hard to know exactly what is meant when a group is described as perceiving, thinking, or feeling. Because such invoked processes have no real collective referents, they may be more appropriately viewed as metaphors than as actual group-level realities.

Use of Member Information and Expertise

It is well established, both in research and in practice, that groups rarely draw on the full complement of members' information, knowledge, and expertise in pursuing collective purposes (Argote, Ingram, Levine, & Moreland, 2000; Dahlin, Weingart, & Hinds, 2005; Thomas-Hunt, Ogden, & Neale, 2003) and that group performance suffers as a consequence (Faraj & Sproull, 2000; Gruenfeld, Mannix, Williams, & Neale, 1996). A great deal of research has been conducted to document the reasons why groups underexploit the informational resources and expertise of their members and to identify interventions that might improve that state of affairs.

Vulnerabilities

Decision-making groups generally focus collective attention on information that is shared among all members, rather than on information that is uniquely held by different individuals. Studies of this phenomenon typically employ a *hidden profile* task, in which information that would identify the best alternative is distributed among members and, therefore, is not initially known to everyone in the group (Stasser & Titus, 1985, 2003). Groups performing hidden profile tasks (for example, making a decision about whom to hire or where to locate a business) rely so heavily on shared information that they rarely come up with the best answer unless individual members are somehow prompted to share with the group the information that they uniquely hold (Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006; van Ginkel & van Knippenberg, 2009).

Not only do groups have difficulty finding ways to get all the relevant information onto the collective table, they also tend to *weight* the knowledge and expertise of their members suboptimally—for example, by misapprehending who actually knows what is needed for the group to make the right decision or turn in a good performance (Littlepage, Robison, & Reddington, 1997). The credence given to a member's contributions often depends much more on that person's demographic attributes (e.g., gender, age, or ethnicity), position (e.g., rank, role, or office), or behavioral style (e.g., talkativeness or verbal dominance) than on the person's actual expertise (Caruso & Woolley, 2008; Hackman & Morris, 1975).

Both overreliance on shared information and flawed weighting processes are generic problems for groups whose purposes require use of member knowledge and expertise. Some groups are considerably more vulnerable to these difficulties than others, however. The new group forms that are now emerging—larger groups with a greater diversity of membership, groups whose composition shifts continuously over time, and groups whose geographically dispersed members rely mainly on electronic technologies for communication—are likely to find managing member information and expertise to be especially challenging. It has been well established, for example, that the larger the group, the greater the chances that worthy individual ideas and insights will be overlooked (Steiner, 1972). The greater the diversity of group membership, the more likely that intergroup stereotypes and conflicts will compromise the full utilization of member resources (Caruso & Woolley, 2008). The more frequently group composition changes, the harder it is for members to keep track of which members have what task-relevant information or expertise (Gruenfeld, Martorana, & Fan, 2000; Lewis, Belliveau, Herndon, & Keller, 2007). And the more that a dispersed group relies on electronic technologies for communication, the more challenging it will be for members to get a good "take" on who knows what (Nemiro, M. M. Beyerlein, Bradley, & S. Beyerlein, 2008).

Overcoming the Vulnerabilities

To use member information and expertise fully and well requires overcoming three hurdles, each of which has been the subject of considerable research. One, the group must *recognize* that certain members do have special information or expertise relevant to the group's work (Bauman & Bonner, 2004; Bunderson, 2003; Littlepage, Robison, & Reddington, 1997). Two, the group must *value* what those individuals have to contribute (Caruso & Woolley, 2008; Scholten, van Knippenberg, Nijstad, & De Dreu, 2007). And three, the group must be sufficiently motivated and coordinated to actually *use* members' knowledge resources

(Faraj & Sproull, 2000; Quigley, Tesluk, Locke, & Bartol, 2007).

A number of conceptual models and empirical studies have sought to identify both the conditions and the leadership interventions that can increase the likelihood that a group actually will recognize, value, and use the information and expertise of its members. Among the structural and contextual factors that have been shown to facilitate use of the full complement of member resources on knowledge tasks are clear and challenging group goals coupled with incentives for achieving them (Quigley, Tesluk, Locke, & Bartol, 2007), a division of cognitive labor that publicly identifies members' areas of special expertise (Stasser, Stewart, & Wittenbaum, 1995), collective accountability for the process by which the team generates its output (Scholten, van Knippenberg, Nijstad, & De Dreu, 2007), an organizational culture that emphasizes shared collective interests rather than individual distinctiveness (Chatman, Polzer, Barsade, & Neale, 1998); and group norms that place a higher value on collaboration and critical thinking than on achieving consensus (Okhuysen & Eisenhardt, 2002; Postmes, Spears, & Cihangir, 2001).

Among the leader interventions that have been found to be helpful are those that elicit and legitimize dissenting views (Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006); those that ask members to reflect on the group and its work, thereby prompting task representations that encourage them to draw upon one another's knowledge (van Ginkel & van Knippenberg, 2009); and those that invite members to explicitly plan the performance strategy the group will use in carrying out its work (Woolley, Gerbasi, Chabris, Kosslyn, & Hackman, 2008). Indeed, this last study suggests that merely having the right group composition (that is, having in the group people who have the expertise required for task success) can even *impair* group performance unless the group also is helped to use that expertise well. Successful performance of the intelligence analysis task used in the study by Woolley and colleagues required use of certain task-relevant cognitive capabilities. Teams either did or did not include members who had scored at the highest levels on a previously administered test of those capabilities and either did or did not receive an intervention that fostered collaborative planning about the use of those capabilities. Performance was enhanced only when groups were composed of members who had task-appropriate capabilities *and* when groups received the collaborative planning intervention. The presence of high expertise in the absence of the social intervention actually decreased team performance relative to teams that neither had the needed expertise nor received the intervention.

Research on the use of member information and expertise is one of the most vigorous and productive areas in the field of small group research. Additional evidence about the conditions and interventions that promote better utilization of the members' information and capabilities should yield not just advances in small group theory but also empirical findings that can constructively guide the practice of using groups to make decisions and perform work.

Group Learning

Groups are situated at the nexus of individuals and organizations. For that reason, they have considerable potential for fostering not just their own capabilities but also those of their members and of the organization as a whole (Edmondson, 2002; Senge, 1990).

The importance of group learning is widely recognized by scholars, and considerable research has been conducted on the topic (Argote, Gruenfeld, & Naquin, 2001; Kozlowski & Bell, 2008; Sessa & London, 2008). Yet, there remains considerable disagreement about exactly what group learning is. Ellis and his colleagues, for example, define it as a change in a group's level of knowledge and skill, produced by shared experiences (Ellis, Hollenbeck, Ilgen, Porter, & West, 2003). Zellmer-Bruhn and Gibson (2006) view learning as the creation of new collective routines. Gibson and Vermeulen (2003) define it as "a cycle of experimentation, reflective communication, and knowledge codification" (p. 206). Wilson, Goodman, and Cronin (2007) say that group learning is "a change in the group's repertoire of potential behavior . . . whether or not it is manifested in externally observable behavior" (p. 1044).

Despite these definitional disagreements, scholars generally concur with Wilson, Goodman, and Cronin (2007) that group learning involves three sequential processes: sharing, storage, and retrieval. According to these authors, the first process, *sharing*, begins when an individual member gains some new knowledge, learns a new routine, or invents a new behavior. Over time, as members become aware of what their fellow members know or know how to do, collective understanding of the group's overall store of knowledge and capabilities emerges. Eventually, what has been learned by various members becomes a property of the group as a whole—an emergent repertoire that exceeds what is known by any one of them.

Researchers have made considerable progress in identifying the conditions that increase the likelihood that learning-oriented sharing will occur in a group. A key condition for sharing is the level of required interdependence built into the team task, since that gives members both occasion and incentive to learn from one another (Wageman, 1995). Beyond the task itself, a broader array of structures, including specialization, formalization, and hierarchy, also can promote sharing and learning, especially

in self-managing teams that may be more in need of structural supports than are manager-led teams (Bunderson & Boumgarden, in press).

Additional factors that have been shown to foster learning-oriented sharing include a climate of psychological safety (Edmondson, 1996, 1999b; Van den Bossche, Gijselaers, Segers, & Kirschner, 2006), a collective sense of group potency or efficacy (Van den Bossche et al., 2006), and strong identification with the group (Van der Vegt & Bunderson, 2005), all of which can be fostered by learning-oriented team leadership. In addition, research has identified a number of specific behaviors by group members that facilitate sharing and that are more likely to be exhibited when the conditions identified earlier are in place. These include speaking up about errors or lapses (Edmondson, 1996; 2003), active listening and communicating (Van den Bossche, Gijselaers, Segers, & Kirschner, 2006), and overt reflection on the group's objectives, strategies, and processes (Schippers, den Hartog, & Koopman, 2008).

Research on *storage*, the second of the three processes posited by Wilson, Goodman, and Cronin (2007), involves use of the group's transactive memory—that is, members' shared awareness of who in a group knows what. Transactive memory, discussed earlier in this chapter, has been shown to facilitate group learning as well as group performance (Austin, 2003; Faraj & Sproull, 2000; Lewis, 2004). Other kinds of repositories also can be useful in storing what is being collectively learned, including shared databases, bulletin boards, and expert systems, as well as standard roles, rules, and procedures developed by the group itself (Argote, 1999). Research is now exploring the differential appropriateness of various kinds of storage systems for different types of group knowledge (Goodman & Darr, 1996).

The third process involved in group learning is the *retrieval* of what has been learned. As Wilson, Goodman, and Cronin (2007) note, "It is not unusual for members of a group to think that they have stored new learning, only to discover that the group does not access it when the next opportunity to apply the learning presents itself" (p. 1050). Although some research has been done on the retrieval process (e.g., Cohen & Bacdayan, 1994; Hollingshead, 1998), much remains unknown about what is required for retrieval to occur smoothly and efficiently.

Group learning is a quite active field of research, but a good number of studies address its core concept only inferentially. That is, some manipulation or intervention is found to improve group performance—and then the inference is made that group learning must have occurred to have generated that improvement. Additional attention to measuring learning processes themselves would be helpful in deepening knowledge about group learning, especially since learning and group performance are not isomorphic (Druskat & Kayes, 2000). That is, performance can improve in the absence of learning (perhaps merely because of increased effort for some kinds of tasks), and learning does not necessarily generate performance improvements (and, in some circumstances, can even result in performance decrements, as was found by Bunderson and Sutcliffe, 2003, and Wong, 2004). It would be good to know more about the circumstances under which group learning does and does not contribute positively to group performance as well as to the personal learning of individual members and to the collective capabilities of the broader organization in which the group operates.

Group Stability

Conventional wisdom about group stability is pessimistic about the viability and performance of groups whose members stay together for a long time. Although teams may become better at working together in the early phases of their lives, the argument goes, the improvements soon plateau and then, at some point, members become too comfortable with one another, too lax in enforcing standards of behavior, and too willing to forgive teammates' lapses. It is better, therefore, to have a continuous flow-through of members to keep teams fresh and sharp.

Conventional wisdom is wrong. Research findings, from both laboratory and field studies, overwhelmingly support the proposition that teams with stable membership have healthier dynamics and perform better than those that constantly have to deal with the arrival of new members and the departure of veterans. An analysis of National Transportation Safety Board (NTSB) records, for example, revealed that 73% of the incidents in the NTSB database occurred on a crew's first day of flying together, and 44% of those took place on a crew's first flight (National Transportation Safety Board, 1994). That there is a liability of newness in flight crew operations was confirmed in an experimental simulation by Foushee, Lauber, Baetge, and Acomb (1986), in which fatigued crews who had flown together for several days caught and corrected more errors than did well-rested crews who were just starting their work together. Similar findings have been obtained for teams as varied as coal miners (Goodman & Shah, 1992) and construction crews (Hapgood, 1994), and these field study findings documenting the benefits of team stability and longevity are affirmed by a number of laboratory experiments (Argote, Insko, Yovetich, & Romero, 1995; Gruenfeld & Hollingshead, 1993; Lewis, Bellieveau, Herndon, & Keller, 2007; Watson, Michaelsen, & Sharp, 1991).

There are, however, two exceptions to the main body of evidence summarized earlier, both of which have to do with the risk that a group whose members remain together for an extended period eventually will lose touch with critical aspects of the external environment. The first exception is research and development teams, for which there is some evidence in support of the conventional view that the relationship between time together and group performance is curvilinear. In a study of 50 research and development project teams, Katz (1982) found that team performance improved over the first two years that members worked together, remained high until around their fourth year, and then declined. Even if these teams had become increasingly competent in working together over a longer term, their *rate* of improvement would have decreased over time. And without the eventual addition of new members, the gains achieved by long-tenure groups surely would be reversed because of the absence of fresh input from external sources—a matter of some consequence for research teams.

The second exception is the risk that stable, long tenure groups may become increasingly insular and rely excessively on habitual routines for performing their standard tasks (Gersick & Hackman, 1990). When these routines are executed inattentively, which is not uncommon for long tenure groups, the accrued benefits of team longevity can be more than negated by unexpected and unnoticed contextual changes that render standard performance strategies irrelevant or inappropriate.

Mechanisms

Robust understanding of the main research findings about team stability and longevity (i.e., that more is better), as well as the two exceptions just discussed (i.e., research teams and the risk of overreliance on habitual routines), requires consideration of the *mechanisms* that generate these effects (Arrow & McGrath, 1995). Conventional wisdom is right that the longer group members work together, the more they are able to predict one another's behaviors, the more knowledgeable they are about other members' quirks, and the more mutual acceptance they are likely to develop. But, rather than posing problems for the group, these developments make it possible for group members to work together smoothly and, potentially, well.

How does this happen? Research and theory to date have focused mainly on the cognitive explanations previously described—specifically, the development of transactive memory (Wegner, 1986) and the creation of shared mental models. For example, Moreland and his colleagues have shown that groups whose members train together develop transactive memory systems that can significantly enhance group performance (Moreland, 1999; Moreland & Myaskovsky, 2000). Moreover, they are likely to develop a robust shared mental model of their performance situation, which can both smooth group interaction and facilitate performance effectiveness (Moreland & Argote, 2003).

The benefits of team stability are not merely cognitive, however; affective and emotional processes also evolve as group members gain experience working together. Socialization processes, although generally viewed as applying exclusively to new members, actually continue to operate throughout members' time working together—and they shape the affective tone of a group as well as members' cognitive states (Levine, Moreland, & Choi, 2001). Specifically, affective socialization can reduce the degree to which members, both individually and collectively, experience ambiguity and anxiety and, thereby, can increase team learning capabilities (Goodman & Shah, 1992; also see the section on group learning in this chapter). Moreover, as group members spend more time together—especially if they come to feel that they are doing reasonably well in achieving the group's purposes—they are likely to develop a sense of collective efficacy (Bandura, 2000) and, perhaps, become a more cohesive social unit.

Group cohesiveness, although commonly invoked in distinguishing effective from failing groups, is something of a fraught concept (Beal, Cohen, Burke, & McLendon, 2003; Hogg, 1993; Mullen & Cooper, 1994). On the one hand, it has long been known that cohesive groups generate greater pressures for member conformity (Festinger, 1950) and, moreover, that members of such groups are disposed to accede to those pressures (Lott & Lott, 1965), which can inhibit both team learning and the correction of errors. On the other hand, cohesiveness often is viewed as a desirable state of affairs that helps groups succeed in achieving their purposes (Chang & Bordia, 2001). For lay persons, the latter view is not unreasonable. When one experiences the coincidence of high cohesiveness and group effectiveness, it can be hard to resist the logical error of assuming that the former is responsible for the latter. In fact, cohesiveness is neither as pernicious as the groupthink model posits nor as generally advantageous as lay persons and some scholars occasionally have suggested.

Knowledge about the antecedents and consequences of group cohesiveness has remained unsettled throughout more than 50 years of research on the topic, which may reflect problems with the construct validity of the concept itself, particularly regarding the *basis* of a group's cohesiveness. It has been suggested, for example, that cohesiveness based on a shared commitment to the work of the group is more functional for groups and their members than that based mainly on highly valued social relationships, since

a focus on intragroup relationships can be at the expense of attention to changing external realities (Hackman, 1992; Chang & Bordia, 2001; Zaccarro & Lowe, 1988). Until such matters are resolved, any conclusion that the positive features of long tenure groups are due mainly to their greater cohesiveness should be drawn tentatively and with great caution.

Overcoming the Liabilities of Newness

The liabilities of newness discussed previously appear to be of a kind that could be remedied by leadership or consultative interventions that foster alertness to the risks of mindlessly executed habitual routines and that help groups develop strategies for staying closely in touch with developments in their external contexts. It is more challenging to identify ways of dealing with the uncertain and shifting membership of new group forms (e.g., groups with constantly changing composition whose members interact mainly using electronic technologies) as well as those whose primary purpose has to do with the development of the team or its members rather than execution of a specific, finite piece of work (e.g., academic seminars or research teams whose purposes include the development of junior members into autonomous scientists).

One managerial strategy for dealing with these problems would be to emphasize the training of individual members rather than the team as a whole, in hopes that people who have been well trained can be swapped in and out of teams much like parts of a standardized mechanical system. Such a strategy has the potential of minimizing both the inefficiencies involved in starting up a new team and the performance decrements that are encountered as members learn how to work together. This approach has been used with success with military aviators (Leedom & Simon, 1995), but the generality of its applicability remains to be assessed.

A second approach would be to establish team stability and continuity one level higher in the social system in which the team operates. That is, specific teams would form and reform in response to changing circumstances, but the social system from which members are drawn would remain relatively stable. Overall purposes, norms, and contextual supports are properties of the parent system, and would persist over time—only the composition of particular teams would change. Because members could import into those teams what they already know and are ready to execute, some of the normal costs and potential liabilities of team start up would be circumvented. These kinds of teams, which were characterized earlier in this chapter as "sand dune" teams, may be especially appropriate for the new, technology-intensive group and organizational forms that are emerging. It would be good to have more empirical data about them, especially about the conditions that enable them to operate efficiently and productively.

Compositional Diversity

The study of diversity in groups is an extraordinarily active area of research on a topic of great scholarly and societal importance. Moreover, two superb reviews of the vast and rapidly expanding literature on diversity in groups recently have appeared: an *Annual Review of Psychology* chapter on "Work group diversity" by Daan van Knippenberg and Michaela Schippers (2007) and an analysis of "What differences make a difference?" in *Psychological Science in the Public Interest* by Elizabeth Mannix and Margaret Neale (2005). These reviews, along with an edited volume on diversity and groups in the *Research on Managing Groups and Teams* series (Phillips, 2008), provide comprehensive coverage of developments in research and theory on compositional diversity since the assessment of the state of the field published a decade ago by Williams and O'Reilly (1998).

Rather than undertake yet another review and analysis of the same material, therefore, this section raises some specific issues that appear to have special relevance for understanding diversity in purposive groups that operate within social systems, relying heavily on the insights and analyses provided in the reviews cited earlier.

What Is Compositional Diversity?

It would seem simple to assess how diverse a given group is—just see if the members are different from one another or if they are pretty much the same. But as the reviewers cited earlier have noted and explained in considerable detail, there actually are many different ways of conceptualizing the differences among members. The simplest definition of a "difference" is provided in the Williams and O'Reilly review: "[F]or our purposes, the effects of diversity can result from any attribute people use to tell themselves that another person is different" (1998, p. 81). But, for scholarly purposes, are some differences of greater interest or consequence than others? Which ones and how should they be conceptualized and measured? Although there are no straightforward answers to those questions, both Mannix and Neale (2005) and van Knippenberg and Schippers (2007) find the concept of "faultlines" to be a useful device for dealing with differences among members.

A faultline, as formulated by Lau and Murnighan (1998, 2005), is a constructed category used to divide a group into subgroups using multiple attributes simultaneously—for example, young Hispanic females versus older Asian males. The concept, which has much in common with Alderfer's

(1997) idea of "embedded intergroups," provides a way of partitioning a group that maximizes between-subgroup variation relative to within-subgroup variation. Faultlines have been shown to be an efficient and powerful concept for the analysis of compositional diversity and its effects (Homan, van Knippenberg, Van Kleef, & De Dreu, 2007; Polzer, Crisp, Jarvenpaa, & Kim, 2006).

What Are the Effects of Compositional Diversity?

Both the Mannix–Neale (2005) and van Kinppenberg–Schippers (2007) reviews conclude that there are no substantial main effects of diversity on group outcomes—it neither helps nor impairs groups reliably. Both reviewers then proceed to do what scholars almost always do when a presumably powerful factor does not generate strong, consistent main effects: They search for moderators and they find some good possibilities. That is the slippery slope that has tempted scholars in a wide variety of substantive areas, from the study of psychic phenomena to the search for the traits of effective leaders (to be discussed later in this chapter). As research progresses, so many contingencies are identified and documented that conceptual models become inelegant and practical advice impossible.

Moderators also invite conservatism in thought and action. If it should be, for example, that the effects of compositional diversity depend on certain enduring features of the social system context (Mannix & Neale, 2005, p. 43), what is to be done with that knowledge? Or how might one alter members' deeply seated diversity beliefs and perspectives if they turned out to moderate composition–outcome relationships (as they also do)? The implication would seem to be that homogeneous groups should be created in certain contexts, and diverse groups created in others. But that strategy implicitly overlooks an important reality about compositional diversity—namely, that diverse groups *always* have a greater pool of knowledge, skill, experience, and perspectives than do homogeneous groups. The question is how to capture and utilize those resources.

Beyond Mechanisms and Moderators

Both the Mannix–Neale (2005) and the van Knippenberg–Schippers (2007) reviews delve deeply and informatively into the mechanisms that are responsible for the dynamics of compositionally diverse groups. Multiple social and psychological processes operate simultaneously when group members deal with others who are distinctively different from themselves and their own groups. For one thing, members are more likely to like, affiliate with, and relate harmoniously to similar others. The other side of the same coin is the human tendency to categorize others based on their most salient or distinctive attributes, which can lay the groundwork for stereotyping other group members relative to members of one's own group. Together, these two mechanisms increase the likelihood that, at least initially, the dynamics of diverse groups will be more halting than harmonious.

Harmonious interaction is indeed pleasant, but it does not facilitate group performance or individual learning. Indeed, working through task-based conflicts and disagreements can be more helpful for performance and learning than either smoothing them over or basking in the pleasure of interacting with similar, like-minded colleagues. Once group members come to realize, if they do, that the knowledge, skills, perspectives, and experiences of their diverse teammates are valuable collective resources, group dynamics can become both more interesting and more productive than is typically the case for homogeneous groups.

Although research on the mechanisms that shape the dynamics of diverse groups generates interesting and informative findings, knowing why something happens is not the same thing as knowing how to create it or to repair it when it goes bad. As medical researchers know well, one does not really understand a malady until one can both create and cure it at will. The implications of this view for research on compositional diversity are clear. Rigorous scholarship on mechanisms and moderators should continue unabated. But it also may be of value to supplement those studies with research that is framed quite differently—specifically, to experiment with creating conditions that could increase the chances, although not guarantee, that diverse groups will become increasingly able to identify, value, and actually use the full complement of what their members bring.

Almost certainly such interventions would involve the simultaneous introduction of multiple conditions that are themselves intercorrelated and that may even be redundant in some ways. Introducing multiple, redundant, correlated interventions (independent variables) is of course taboo for scholars who aspire to tease out specific causes that are tightly linked to specific effects. But that is exactly what those who seek to make constructive differences in social systems do. And, interestingly, such interventions also would have a nice resonance with the concept of faultlines, itself a concept with multiple attributes that are intercorrelated within the ecologies of social systems.

Research on compositional diversity has come a long way in the decade since the Williams–O'Reilly (1998) review, as has been impressively demonstrated by Mannix and Neale (2005) and van Knippenberg and Schippers (2007). It may now be time to return to the Lewinian roots of group psychology and devise action research projects that

have the potential to further advance knowledge even as they help groups find new ways to cultivate and use well their members' diverse resources.

The Context of Group Behavior and Performance

There are no truly freestanding groups. All groups operate within some broader social system whose properties and processes affect group behavior. Although contextual influences are more frequently discussed in reports of field research than of laboratory research, they also are present and powerful in the experimental laboratory. The difference is that, in the laboratory, they are established by the experimenter rather than by organizational authority figures. It is the experimenter who selects and arranges the physical space in which the research will be conducted, specifies group purposes, decides what rewards will be available and administers them, provides the resources that teams require for their work, and establishes the basic norms of conduct that guide behavior in the setting. In effect, the experimenter creates and manages a social system—albeit a small and temporary one—that serves as the context of the group. Precisely because contexts are so powerful, expert experimenters go to great lengths to ensure that contextual features are standardized for all groups in a given study.

Group contexts rarely are discussed in research reports, however. When context is mentioned at all, it usually is as a constraint on external validity: "Since the findings were obtained in a laboratory setting, generalizations to organizational life should be made with caution." Or: "Because the groups in this study all operated in a bureaucratic organization, the findings may not apply to network-type enterprises." Or: "These findings may not generalize to Asian cultures in which collective outcomes are more highly valued than they are in the United States." Although contextual features can indeed moderate the relationships among other variables, transactions between groups and their contexts also are an integral part of everyday group behavior (Ancona & Caldwell, 1992a; Haas, 2006). As group researchers are gradually coming to recognize, the context is part of the *phenomenon* of group dynamics, not merely a factor that constrains the generalizability of empirical findings about them (Frey, 2003; Ilgen, 1999; Lacey & Gruenfeld, 1999; Putnam & Stohl, 1990; Rousseau & Fried, 2001; Sundstrom, 1999; Wageman, 1999).

Contexts also shape both what is studied and what is found. Certain phenomena are highly constrained in some contexts. If one is interested in studying the effects of task design on group performance, for example, prospects for success are dim if the research is carried out in a setting in which a large number of groups perform essentially the same task, thereby limiting the variability of the very phenomenon under study. By contrast, Sutton and Hargadon (1996) chose to study group brainstorming in a product development firm, in which the phenomenon was both vivid and ubiquitous. The accessibility of certain contexts, moreover, can subtly shape researchers' choices about *what* to study. The ready availability to academically based researchers of laboratory experimental groups, student project teams, and classroom demonstrations such as "survival" and negotiation exercises, for example, can result in bodies of knowledge that may be more influenced than either scholars or research consumers realize by the special features of academic contexts. The following sections identify some specific contextual features that may deserve more attention by group researchers than they typically receive.

Cues and Contingencies

Groups in different contexts routinely deal with different kinds of content—the materials, ideas, or issues with which they work. Top management teams, for example, deal constantly with power and influence; task forces with ideas and plans; human service teams with emotions and relationships; production teams with technology; and so on. As is shown in collections of research studies on different types of teams, these differences in content strongly affect the character of group interaction (Frey, 2003; Hackman, 1990).

It has long been known that context-supplied cues activate the motivational and emotional states of individuals, and the mechanisms that drive these effects are well established (Atkinson, 1954; Schachter, 1964; Schultheiss & Brunstein, 1999). Since all members of any given group experience many of the same cues in the group's context, these states can diffuse across members and spawn a common emotional interpretation of an arousing situation or a heightened (or depressed) level of collective motivation (Brown, 1965; Edmondson, 1999a).

Contexts also differ in the contingencies that link group behaviors with outcomes. In some contexts, for example, achieving group purposes depends mainly on exerting sufficient collective effort; in others, it is more a matter of applying the right knowledge and skill; in still others, it depends heavily on how members approach and execute the work—the group's performance strategy (Hackman & Wageman, 2005a, b). A robust understanding of group behavior and performance, therefore, requires not just knowledge about the cues that are present in its context but also about the behavior–outcome contingences that characterize the social system within which the group operates. A great deal presently is understood about these matters

at the individual level of analysis, but much remains to be learned about how they are assembled into processes and properties of the group as a whole.

Purposes, Places, and Resources

With the exception of self-governing groups, the purposes that groups pursue, as well as the places in which they operate and the resources and supports that are available for their work, are contextually supplied. Considerable empirical research has been conducted on certain aspects of the group context, such as reward contingencies (Beersma et al., 2003; Lawler, 2003; Wageman & Baker, 1997; Zenger & Marshall, 2000), the amount and kinds of information groups can obtain (Haas, 2006; Haas & Hansen, 2007; Hargadon, 1999), and the availability of educational resources to foster team learning (Salas, Nichols, & Driskell, 2007). Relatively little systematic evidence has accumulated about the appropriateness of groups' spatial arrangements or the munificence of the material resources that are available for carrying out group work.

Research on physical space would be especially welcome. Many years ago, Hall (1969) and Barker (1968) explored how settings shape social behavior. Hall used the terms "fixed feature space" and "semi-fixed" feature space to refer to the permanence versus moveability of the physical surround. Steele (1973) subsequently added the term "pseudo-fixed feature space" to designate physical features that are readily changeable but that are treated as if they were fixed—for example, when members of a small discussion group meet in a room in which all chairs are aligned in forward-facing rows but do not rearrange them before beginning their discussion. More recent commentators also have discussed how the properties of physical spaces shape and constrain group behavior (Burgoon, 1983; Gladwell, 2000), but the leads they have generated await systematic empirical investigation.

Authorities, Clients, and Other Groups

The contextual influences discussed previously are for the most part subtle, things one might not notice if one were not looking for them. By contrast, authority figures and other groups are among the most pervasive and salient features of a group's context. Few groups can accomplish their purposes without coordinating with external groups and authorities, obtaining information from them, receiving their feedback, or relying on them for assistance of some kind (Ancona & Caldwell, 1992a; Haas, 2006).

The relationship between groups and the authority figures in their contexts has long been of central concern in psychodynamic analyses of group behavior, discussed earlier in this chapter. These days, the field also is seeing substantially increased attention to groups' relationships with *other* groups—those a group serves, those with which it must coordinate to achieve its purposes, and those with which it is in competition (for details, see the chapters in this volume on intergroup relationships by De Dreu and by Yzerbyt & Demoulin). Indeed, the active stream of research in the communications literature on what are called "bona fide" groups gives extensive attention to the intergroup context of group behavior (Stohl & Walker, 2002), including transactions that extend even beyond groups' own organizational boundaries into the external environment (Lacey & Gruenfeld, 1999; Schopler, 1987). As interorganizational relationships become more extensive and more global in reach, it would not be surprising to see research on intergroup coordination become as extensive in future years as research on intragroup interaction has been heretofore.

Collective Values

Perhaps the most powerful contextual feature of all in shaping group behavior and performance is the *value* that the social system within which a group operates places on collaborative work. Some years ago, Walton (1985) identified two general constellations of organizational values, which he refers to as "control" versus "commitment" orientations. In the former, authorities impose control over all aspects of the work in the pursuit of efficiency; in the latter, they seek to generate and utilize member commitment to achieve collective purposes. As Walton subsequently demonstrated, group life was strikingly different under these two sets of values (Walton & Hackman, 1986). In control-type organizations, groups generally were spontaneously formed by organization members themselves to provide social satisfaction and some level of protection for members. Management, at best, ignored such groups and often attempted to kill them off. In commitment-type organizations, by contrast, management actively created and fostered work groups of various kinds and came to depend heavily upon them for accomplishing organizational objectives.

As Walton's research shows, group life is profoundly affected by the values that pervade the broader social system. Further research on the value context of groups, including those that differ across national cultures, could be highly informative in furthering understanding of the other features of organizational contexts discussed previously, as well as the dynamics of group-context relationships more generally.

Temporal Issues

Temporal issues have become an increasingly prominent theme in research on group behavior and performance.

Among the most influential early studies on time were Gersick's (1988, 1989) empirical studies of the temporal pacing of group development, research on the temporal entrainment of group activities by Kelly and McGrath (1985; McGrath & Kelly, 1986), and the analysis by Ancona and Chong (1996) of the ways pace, cycles, and rhythm shape group behavior. There followed numerous books and articles expanding on those topics and exploring other temporal phenomena (e.g., Ancona, Okhuysen, & Perlow, 2001; Blount, 2004; McGrath & Tschan (2004, 2007).

The flow of research on the temporal issues shows no sign of abating. As will be seen in the next section of this chapter, the impact of leader coaching strongly depends upon the time in the group life cycle when it is provided. But temporal dynamics also are consequential for groups in several additional ways described next.

Beginnings

Most frameworks that describe the process of group development specify a number of stages through which groups pass, with movement into each successive stage contingent on successful completion of the previous one. The "forming-storming-norming-performing" sequence described by Tuckman (1965) is perhaps the best known of the stage models. As plausible as the Tuckman model is, research on temporal dynamics in groups has raised questions about its generality and validity. In a field study of the entire life histories of a number of project teams, for example, Gersick (1988) found that each group she tracked developed a distinctive approach to its task immediately after commencing work, and stayed with that approach until almost exactly halfway between its first meeting and the project deadline. At that point, all teams experienced a "midpoint transition" that involved dropping previous patterns of behavior and adopting new roles and performance strategies. This new approach remained in place until near the project deadline, at which time the group focused on a new set of issues having to do with termination.

The most widely discussed of these findings, subsequently replicated in the experimental laboratory (Gersick, 1989), has been the midpoint transition, perhaps because it most clearly signaled that group development is shaped more by temporal factors than by progressing through a fixed series of stages (Okhuysen & Waller, 2002; Waller, Zellmer-Bruhn, & Giambatista, 2002). But equally as important in understanding group development is what happened at the beginning of the lives of the groups she studied—namely, that their initial pattern of interaction, which they typically fell into immediately and without deliberation, established the track on which they stayed for the entire first half of their life cycle. The same thing was found by Ginnett (1993) for an entirely different kind of group—aircraft flightdeck crews. Specifically, what happened during a crew's preflight briefing shaped members' behavior for a considerable time thereafter. Moreover, getting off to a good, fast start may be a prerequisite for success: In a study of high and low performing project teams, Ericksen and Dyer (2004) found that the high performing teams mobilized themselves more quickly and participatively than did low performing teams. The beginning of a group's life or task cycle, it appears, is highly consequential both for the life of the group and for its eventual performance.

Entrainment, Pacing, and Rhythm

The pace and rhythm that will characterize member interaction get established early in a group's life, as groups adjust their activities to synchronize with the phase, periodicity, or other temporal parameters of their work (Ancona & Chong, 1996, p. 36). A specific deadline, for example, can drive the group's pace and that pace will be maintained on subsequent tasks—even when the amount of time available for the subsequent work changes (Kelly & McGrath, 1985). When there is no deadline or it is ambiguous, groups do not establish a pace for their work and tend to flounder (Davis-Sacks, 1990).

Although a temporal anchor may be required for a group to be able to pace itself on a given type of task, entrainment apparently does not persist across different task types. In a study by Harrison, Mohammed, McGrath, Florey, and Vanderstoep (2003), groups that initially were entrained on a certain task changed their pace of work when, on a second trial, they were given a task of a different kind. But they returned to the original pacing when, on a third trial, they once again worked on a task of the first type.

Regular cycles, like time limits, can pace a group and generate a characteristic rhythm for work activities. Semesters in academia have this quality, as do quarters for sales teams in businesses (Gladstein, 1984). And even when there is no natural rhythm, as was the case for teams at a continuously operating semiconductor plant studied by Abramis (1990), arbitrary temporal markers almost always are put in place. At the semiconductor plant, these were six-week production periods. Although these periods had no external referent whatever, they served as the pivot around which all team planning and pacing took place. When natural temporal markers do not exist, we apparently are driven to create them—and then to use them to give rhythm to our work.

Constructions of Time

People differ in both their perspectives on time and their perceptions of temporal markers. Those differences can have

profound effects, especially when groups are composed of members from different cultures (Ancona, Okhuysen, & Perlow, 2001; Gibson, Waller, Carpenter, & Conte, 2007). They affect matters of substantive interest, of course, such as how teams experience and deal with deadlines and the duration of time itself. But they also have implications for the methodologies used by group researchers. How, for example, should the temporal aspects of group behavior be studied when there is reason to believe that members may differ substantially in time perspectives or perceptions? What interpretive and external validity issues arise when research is done on groups whose members have a highly restricted time horizon—that is, when members know that they will meet only once for one hour to perform one task? To what extent do the temporal dynamics in such groups differ from those that have an extended or indefinite time horizon, such as the groups tracked by McGrath and his colleagues as their tasks and membership changed over time (McGrath, 1993)? As Ballard, Tschan, and Waller (2008) suggest, temporal issues such as these merit considerably more thought and attention by group researchers than they heretofore have received.

Team Leadership

The paradox about team leadership is this: On the one hand, observers so pervasively attribute to leaders responsibility for team successes and failures that the phenomenon has been characterized as the "leader attribution error" by Hackman and Wageman (2005b) and as part of the "romance of leadership" by Meindl (1990). On the other hand, researchers over the years have been unable to identify the particular traits or behavioral styles that reliably distinguish great from so-so team leaders. Many different attributes of individuals have been found to be modestly associated with rated leader effectiveness and (especially) with who is chosen to occupy leadership positions (for an early review on traits and group behavior, see Mann, 1959; for a contemporary and more trait-sympathetic review, see Zaccaro, 2007). But the usefulness of these findings for guiding either theory development or leadership practice is limited because the size of the empirical relationships typically has been so small.

Alternatives to Traits

If traits are not controlling, then perhaps *anyone* could be an effective group leader if he or she learned the right ways to behave. But no one leadership style has been found that works well across situations—a style that is effective in one situation may not work so well in another (for a review, see Bass, 1990). Research on leader styles, therefore, evolved from a search for the one best style to contingency models that specify which leader behaviors work best in which circumstances (Fiedler & Garcia, 1987; Vroom & Jago, 1988; 2007). Such models identify those attributes of the situation and of the group being led that determine what leader behaviors are likely to be effective, thereby providing research-based guidance about how leaders ought to behave in various circumstances (for a review, see Yukl, 2002).

As research identifies more and more moderators of the leader behavior–group outcome relationship, contingency models necessarily become so complex that they can require of leaders a level of online cognitive processing that exceeds human capabilities (Gigerenzer, 1999; Simon, 1990). Moreover, direction of causality remains an open question. Although both scholars and lay persons generally view leader behavior as the cause of team behavior, it has long been known that in some circumstances the causal arrow points in the opposite direction (Farris & Lim, 1969; Lowin & Craig, 1968). For example, a team that exhibits cooperation and competence can elicit a considerate, participative leadership style, whereas one that is hostile and incompetent can prompt a more directive style.

These findings suggest that individual differences among leaders may be more usefully dealt with as *competencies* (McClelland, 1973), things the leader knows or knows how to do, rather than as either personality traits or behavioral styles (for a debate on this matter, see Hollenbeck, McCall, & Silzer, 2006). Identification of the competencies most needed for effective team leadership is still a work in progress (Gist & McDonald-Mann, 2000; Salas, Kosarzycki, Tannenbaum, & Carnegie, 2004). Whatever the specifics turn out to be, they clearly will include competencies both in diagnosing social systems (a cognitive capability that centrally involves inductive conceptualization) and in taking constructive action to address group or contextual problems and opportunities (Hackman & Walton, 1986).

Emergent Leadership

Although the main body of leadership research is about individuals who hold formal roles as leaders, scholars are giving increasing attention to the *emergence* of leaders within task-performing teams. This development can be at least partially attributed to the rise of interest in self-managing work teams, especially those that explicitly are designed without anyone designated as the formal team leader (Cohen, Ledford, & Spreitzer, 1996). Initially, research on leadership emergence focused mainly on the personal attributes of those individuals who were most likely to become group leaders. For example, general cognitive ability and certain personality traits, such as conscientiousness and extraversion, have been shown to enhance

an individual's standing in the informal group structure (Neubert, 1999; Smith & Foti, 1998; Taggar, Hackett, & Saha, 1999).

More recently, scholars have begun to examine the impact of the behavior of emergent group leaders on group processes and performance. For example, emergent leaders who help a group set realistic goals have been shown to enhance group efficacy (De Souza & Klein, 1995; Pescosolido, 2001); and emergent leaders who help groups manage their emotional processes help foster group identity and solidarity (Pescosolido, 2002). These studies have laid the groundwork for recasting research on group leadership from its historical focus on individuals to an emphasis on the accomplishment of those leadership *functions* that are most critical to group effectiveness (Day, Gronn, & Salas, 2004; Hackman & Wageman, 2005b; Nye, 2008; Nohria & Khurana, 2010).

Leadership Functions

The functional approach to team leadership was first articulated by McGrath (1962), who suggested that a team leader's main job "is to do, or get done, whatever is not being adequately handled for group needs" (p. 5). Effective leaders, therefore, do, in their own idiosyncratic ways, whatever is necessary to ensure that those functions that are critical to the achievement of team purposes are accomplished.

Leadership functions can be partitioned into two general classes: designing the group and providing hands-on group leadership (Hackman & Walton, 1986). The latter class has received the major portion of research attention, from the classic study of autocratic, democratic, and laissez-faire leadership of boys' clubs by Lewin, Lippitt, and White (1939) to the present day. But as Wageman (2001) has shown, it is the former function—getting the group set up right—that turns out to make the most difference. Specifically, she found that leaders' design choices controlled more than four times as much variation in both team self-management and performance effectiveness as did their hands-on coaching activities. Moreover, well-designed teams benefitted greatly from competent leader coaching and were not much hurt by bad coaching. Poorly designed teams, by contrast, were not helped by competent coaching—and were devastated by bad coaching.

Timing

Group researchers are increasingly recognizing that *when* a leadership intervention is made can be as important as the content of that intervention or how skillfully it is delivered. Work by Kozlowski and his colleagues, for example, shows that the kind of leadership assistance teams need depends upon the stage of their development and, moreover, that there are specific times in the group life cycle when teams are more and less open to receiving leadership interventions (Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996; Kozlowski, Watola, Nowakowski, Kim, & Botero, 2009). Because the issues that are most salient for a group evolve as it develops, Kozlowski and his colleagues suggest that the proper focus of leader-facilitated "learning sessions" is quite different for newly formed versus mature groups. Similar conclusions are reached by Hackman and Wageman (2005a), who give special attention to the kinds of coaching interventions that are most impactful at the beginnings, midpoints, and ends of task performance cycles. They posit that even competently delivered coaching will not be helpful if it addresses issues that are not alive for a team at the time it is provided.

Overall, research has identified four times when leader actions can make a large and constructive difference in team behavior: (1) before the group even convenes, when the leader can structure the group and arrange for resources and contextual supports that facilitate competent teamwork (e.g., Hackman, 2002); (2) when the group begins work on its task, at which point the leader can bound the group, help members become oriented to one another and to their collective work, and foster collective motivation to perform that work well (e.g., Ginnett, 1993); (3) at the midpoint of the task cycle, when the group has logged some actual experience on the task and the leader can help members reflect on and improve the appropriateness of its performance strategy (e.g., Woolley, 1998); and (4) at the end of the task cycle, when the leader can help members learn from their collective experiences and thereby strengthen the group's overall complement of knowledge and skill (Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008).

Shared Leadership

Shared leadership has been discussed, usually hopefully but not always favorably, since the earliest days of group research (Gibb, 1954). The phenomenon has become increasingly relevant recently as organizations experiment with co-leaders (Heenan & Bennis, 1999) and with widely distributed leadership in self-governing groups and organizations (Cheney, 1999). The research record on the efficacy of shared leadership is decidedly mixed (Pearce & Conger, 2003). On the one hand, when leadership is shared there are by definition more resources available to fulfill leadership functions; on the other, coordination difficulties, social loafing, and struggles for power or dominance can significantly erode the utilization of those resources.

The tension between the risks and benefits of shared leadership are perhaps most vividly seen in leadership teams—that is, teams composed of individual leaders

whose collective task is to provide leadership to a broader organizational unit or to a whole enterprise (Berg, 2005; Edmondson, Roberto, & Watkins, 2003; Hambrick, 2007; Wageman, Nunes, Burruss, & Hackman, 2008). Such teams are composed of powerful, competent people who value being on the team and who, collectively, can command whatever resources as are needed to help the team succeed. Yet the teams themselves are underdesigned, underresourced, riddled with undiscussable authority dynamics, and so inefficient that members despair over the time they have to spend in them (Wageman & Hackman, 2010). Precisely because group processes in these teams are simultaneously vivid and fraught, the lessons learned from research on them may be especially useful in identifying what is required for the effective sharing of team leadership more generally.

Collaboration in Dispersed Groups

As organizations become more global in reach and as communications and information processing technologies become more powerful and pervasive, increasing numbers of groups are relying on these technologies for carrying out their work. Technology is evolving so quickly that social science research on virtual and distributed teams necessarily is lagging somewhat behind group and organizational practice. Nonetheless, a good deal has been learned about groups whose members communicate mainly electronically, and the pace of research on such groups is accelerating.

The earliest research on distributed team processes was carried out in the 1990s, and generally involved direct comparisons of face-to-face and "virtual" teams in laboratory settings. These studies treated virtuality as a dichotomous variable: Members interacted either face to face or using electronic technologies exclusively (e.g., Hollingshead, McGrath, & O'Conner, 1993; McLeod, Baron, Marti, & Yoon, 1997; Weisband, 1992). These days, even co-located teams employ one or more forms of computer-mediated interaction, whether email, instant messaging, desktop videoconferencing, file-and-application sharing, group decision support systems, electronic bulletin boards, or real-time calendar and scheduling systems. Thus, virtuality now is more appropriately understood as a matter of degree rather than as identifying a particular type of team (Bell & Kozlowski, 2002; Martins, Gilson, & Maynard, 2004).

Among the teams that rely most extensively on electronic technologies for communication and coordination are those whose members are geographically dispersed. Indeed, a recent analysis by O'Leary and Cummings (2007) suggests that the nature and extent of a team's dispersion, rather than the number or kind of electronic aids a group uses, may provide the greatest leverage in understanding its dynamics. Specifically, O'Leary and Cummings distinguish among and provide indices for assessing three types of dispersion: spatial, temporal, and configural. Spatial dispersion, the average physical distance among team members, lessens the possibility of face-to-face communication. Temporal dispersion, the extent to which group members' work or awake hours overlap, lessens the possibility of synchronous problem solving. Configural dispersion, the number of different locations where members are located and the distribution of members across those locations, increases the complexity of coordination and subgroup relationships.

Dispersed groups can be just as "real" as face-to-face groups—that is, they can be as bounded, interdependent, and stable over time as those whose members do their work around a common table. The difference is their greater reliance on communication and information processing technologies for planning and executing the team's work. The body of research findings about what commonly are called virtual teams, therefore, can perhaps more appropriately be understood as providing insight into the dynamics of real-but-dispersed teams that necessarily use electronic technologies for communication and coordination.

What Is Known

It is reasonably well established that use of electronic technologies reduces both the overall amount of communication in a group and members' sense of a shared group identity (Bhappu, Griffith, & Northcraft, 1997; Hiltz, Johnson, & Turoff, 1986; Hollingshead, 1996; Straus, 1996), although to a lesser extent for groups whose members have experience working together (Alge, Wiethoff, & Klein, 2003; Bouas & Arrow, 1996). Use of electronic technologies does tend to equalize member participation (Kiesler, Siegel, & McGuire, 1984; Straus, 1996; Zigurs, Poole, & DeSanctis, 1988), as well as to increase the likelihood that minority members will express their views (McLeod, Baron, Marti, & Yoon, 1997), and to reduce members' attentiveness to ingroup–outgroup differences (Bhappu, Griffith, & Northcraft, 1997). These phenomena may occur because electronic technologies mask some social cues and, therefore, attenuate the impact of status differences and subgroup memberships on participation dynamics (Dubrovsky, Kiesler, & Sethna, 1991; Hollingshead, 1996; Sproull & Kiesler, 1986).

The *content* of group interaction can be problematic in groups that use electronic technologies, however. Members are more likely to exhibit uninhibited behavior such as insults, swearing, and name-calling (Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1986). Moreover, they tend to make what Wageman (2003) calls

"sinister" attributions about the commitment of teammates who do not respond quickly enough to team needs. When communications break down because of a technological failure, for example, the resulting silence may be wrongly assumed to reflect a member's poor work ethic (Cramton & Orvis, 2003).

Although teams that rely on electronic technologies do *not* apply less effort to their work than face-to-face teams, reliance on electronic technologies does impair group performance for tasks that require high levels of coordination in real time (Shepherd, Briggs, Reinig, Yen, & Nunamaker, 1996; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Straus & McGrath, 1994). Such groups generally take longer to get things done (Graetz, Boyle, Kimble, Thompson, & Garloch, 1998; Hollingshead, 1996; Straus, 1996; Weisband, 1992), and they tend to have problems staying on schedule and budget (McDonough, Kahn, & Barczak, 2001). Beyond the reality that typing is slower than talking, members of groups that communicate using computers also may be tempted to multitask while at the computer rather than to focus exclusively on the team's work (Lebie, Rhoades, & McGrath, 1996; Malhotra, Majchrzak, Carman, & Lott, 2001).

Research Frontiers

Advanced communication and computational technologies have become commonplace in collaborative work. Sometimes it is a matter of necessity, such as for groups whose members are globally dispersed. Or it may be for economic reasons—to lessen the costs in time and travel for group meetings. Or it may simply be because younger members have grown up with such technologies and would find it strange *not* to use them routinely. It may be time, therefore, for group scholars to move beyond studies that further document the risks and benefits of electronic technologies and to focus more on identifying the conditions that increase the likelihood that groups will use them well. Such a development would parallel what is happening in research on compositional diversity discussed earlier—movement from documentation of the main effect risks and benefits of diversity to identification of the conditions that enable groups to recognize, value, and fully utilize their members' differences.

Although it is not yet known what conditions will emerge as most critical in fostering the effective use of electronic tools by groups, one point of departure for research and theory could be what is already known about the conditions that foster team effectiveness (Gibson & Cohen, 2003). It is reasonably well established, for example, that performance is facilitated when teams are small and compositionally stable with clear, but permeable, boundaries and interdependence for some consequential shared purpose (Hackman, 2002). What is *not* known is whether these same conditions are critical for teams whose members heavily use electronic means of communication and coordination. One could argue, for example, that electronic technologies render team structures less critical than otherwise would be the case, since these technologies make it possible for members to continuously and autonomously adjust in real time everything from their work strategies to the composition of the group itself. But, one also could argue that enabling structures are *more* important for technology-intensive dispersed groups because such groups run a greater risk of devolving into disorder and disorganization than those whose members work in the same place at the same time. Whatever the key conditions for effectiveness for dispersed teams turn out to be, it surely will be a significant team leadership challenge to create and maintain them when members are scattered across geographies and time zones—also a matter worthy of attention by group researchers (Cummings, 2007).

Another research challenge is to identify the proper mix of face-to-face and electronically mediated interaction. Research has shown that it is helpful to temper electronic collaboration in dispersed teams with periodic face-to-face interaction (Maznevski & Chudoba, 2001). The emerging question is to determine when in the team life cycle face-to-face contact is most useful. Studies of the temporal aspects of group leadership (discussed earlier) identified beginnings, midpoints, and ends as times when groups are most ready to accept and make use of leadership interventions. Might these three times also be ones when face-to-face interaction is most useful? The importance of face-to-face engagement at the beginning of a group's work has been empirically demonstrated (DeMeyer, 1991; Robey, Khoo, & Powers, 2000). Midpoints and ends of task cycles might also be times when it would be helpful for group members to come physically together to debrief and to reflect on how they might best utilize their electronic resources in carrying out their collective work.

The number of different technologies available for use by task-performing groups has increased dramatically in recent years, and the rate of growth shows no sign of abating. Indeed, a sufficient diversity of electronic resources has accumulated that it may now be possible to empirically identify those types of technologies that are, and are not, especially useful to groups that perform different types of tasks—for example, those that involve the generation of ideas versus the evaluation of issues versus the implementation of actions. As knowledge about such task by technology interactions accumulates, groups will become increasingly able to wisely select the kinds of electronic resources that are most appropriate for their particular circumstances. And, perhaps, they may become

less inclined than some groups are at present either to resist using such technologies at all or, alternatively, to adopt relatively mindlessly whatever new technological resources as become available.

CONCLUSION

As noted at the outset of this chapter, groups evoke strong feelings—people tend either to love them or to despair of them. Scholars, through their research, pull in the tails of this distribution as they identify and document the structures, contexts, and leader behaviors that can help groups circumvent their nastiest dysfunctions—and, occasionally, capture the synergies of which the best groups actually are capable. The aspiration of this chapter has been to provide scholarly readers an enriched understanding of the intellectual history of group research as well as an overview of the current frontiers of the field.

The 1940s and 1950s were heady days for group research, a time when a variety of approaches were tried, found to not quite provide what was needed, and then were supplanted by fresh ideas about how to study group behavior and performance. The lessons learned in those years have much to teach contemporary group researchers. Specifically, the six approaches reviewed in this chapter—the psychodynamic, network, action, process-focused, decision-analytic, and complex systems approaches—offer some tantalizing leads for the future.

The psychodynamic approach reminds us that some of the most powerful influences on group dynamics are implicit and mostly hidden from view. The network approach invites us to apply today's powerful computational tools to generate new understanding of the evolution over time of relationships within and among groups. The action approach cautions us not to focus too much on the search for tight causal links between inputs, processes, and outputs and, instead, to explore ways to create conditions that foster the achievement of normatively valued outcomes. The process-focused approach also orients our attention to computational tools, this time to chart patterns of member interaction—who says what, to whom, when, with what effect—at a level of detail never before possible. The decision-analytic approach offers a way to go beyond the search for additional cognitive dysfunctions and to seek instead strategies that help groups draw on the full complement of members' information and expertise in making collective judgments and decisions. And the complex systems approach reminds us that groups, even if small and short-lived, really are dynamic social systems that create and redefine the very realities that shape their own behavior.

In 1974, Ivan Steiner ended his classic *Journal of Experimental Social Psychology* article on "Whatever Happened to the Group in Social Psychology?" with these words: "If the tea leaves tell me true, social psychology in the late 1970s is going to look a lot like social psychology in the late 1940s—better, of course, but groupy once more" (Steiner, p. 106). It did not happen back then, but if we combine the lessons from the history of small group research with the knowledge and research tools that now have become available, it very well could be that Steiner was absolutely right—if just a few decades early.

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