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WHAT MAKES TEAMS WORK: GROUP EFFECTIVENESS RESEARCH FROM THE SHOP FLOOR TO THE EXECUTIVE SUITE

CEO Publication
T 96-16 (310)

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December, 1996

To Appear in the 1997 early review of the Journal of Management, Volume 23, Number 3, 239-290.

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The authors would like to thank Andrew Garcia, Mandana Abbassian-Kashi, Karen Mayo, Nora Osganian, and Olivia Salazar for their research assistance: their help in doing the computer search, retrieving and copying the articles, and organizing the references was invaluable. We would also like to thank David Finegold, Elizabeth Frawley, Edward Lawler, Eric Sundstrom, and the anonymous reviewers for their comments on previous drafts of the paper.

Abstract

In this article, we summarize and review the research on teams and groups in organization settings published from January 1990 to April 1996. The article focuses on studies in which the dependent variables are concerned with various dimensions of effectiveness. A heuristic framework illustrating recent trends in the literature depicts team effectiveness as a function of task, group, and organization design factors, environmental factors, internal processes, external processes, and group psychosocial traits. The review discusses four types of teams: work, parallel, project, and management. We review research findings for each type of team organized by the categories in our heuristic framework. The article concludes by comparing the variables studied for the different types of teams, highlighting the progress that has been made, suggesting what still needs to be done, summarizing key learnings from the last six years, and suggesting areas for further research.

The management and academic press increasingly emphasizes the importance of teams for organizational success in the modern economy. Books and articles have been written about how to design empowered or self-directed work teams (Wellins, Byham & Wilson, 1991; Orsburn, Moran, Musselwhite, & Zenger, 1990), parallel learning teams (Bushe & Shani, 1991), cross-functional project teams (Parker, 1994), executive teams (Nadler & Ancona, 1992), and team-based organizations (Mohrman, Cohen, & Mohrman, 1995). The use of teams has expanded dramatically in response to competitive challenges. For example, 82% of companies with 100 or more employees reported that they use teams (Gordon, 1992). Sixty-eight percent of Fortune 1000 companies reported that they used self-managing work teams and 91% reported that they used employee participation groups in 1993 compared to 28% and 70% respectively in 1987 (Lawler, Mohrman, & Ledford, 1995). In examining data on 56,000 U.S. production workers, Capelli and Rogovsky (1994) found that one of the most common skills required by new work practices is the ability to work as a team. Academics have increasingly selected teams and team effectiveness as important areas for research in response to the increased use of teams in organizations. Hundreds of studies have been published about teams in the six years since Kenneth Bettenhausen last reviewed this literature for the *Journal of Management*.

Our focus for this review is studies of teams in organizational settings. These include studies of teams that produce goods, deliver services, recommend improvements, design new products, and determine strategic direction for their organizations. We restrict our attention to studies of teams in which effectiveness outcomes (performance, attitudinal, or behavioral) were captured for individuals, teams, business units or organizations. We chose this focus for three major reasons. First, the findings from teams performing real tasks in organizational settings can more readily be generalized to the world of work. The findings from studies of undergraduate psychology or business students are much less likely to apply to practicing research and development managers, blue collar workers, or executives. Second, organizational features external to the team can be extremely important determinants of effectiveness, yet they are rarely examined in laboratory settings (Hackman, 1987). For example, aspects of the organizational context such as reward systems or organizational structure can have strong impacts on team functioning. Likewise, relationships with key stakeholders outside a team can influence task performance (Ancona, 1990). Third, we wanted to review a coherent body of work. Thus, we are willing to sacrifice the rigor

of the experimental laboratory to deal with the confounds of the real world in the hope that the findings we identify can be used to guide management practice and to improve effectiveness.

However, we do review conceptual and theoretical articles to help us understand the factors that contribute to effectiveness of teams. We also occasionally present findings from experiments done in the laboratory. We make these exceptions for newer areas of research such as group cognition in which more conceptual than empirical work has been done and few field studies exist. We also occasionally refer back to studies conducted prior to 1990, although our emphasis is work that has been done in the last six years.

We selected 200 articles for possible inclusion from a computer search of the business index, the psychological index, and the current contents index that resulted in thousands of abstracts. We used keywords such as performance, effectiveness, affect, and cognition preceded by either the term group or team. We also used key words for different types of teams, for example, management teams and project teams. Ultimately, we focused on 54 studies of teams in organizations that included measures of effectiveness and were carried out in the period between January 1990 and April 1996.

In this review, we present a heuristic framework for team effectiveness that illustrates recent trends in the literature. We discuss four different types of teams — work, parallel, project, and management. We present research findings for each type of team organized by the categories of variables in our heuristic framework. We begin by defining what we mean by team, each type of team, and effectiveness.

Key Definitions

Team

What is a team in an organizational setting? There are multiple definitions but the one we use comes from the work of Hackman (1987) building on the work of Alderfer (1977). Guzzo and Dickson (1996) draw from the same intellectual tradition in their recent review; Sundstrom, DeMeuse and Futrell (1990) used a similar definition. A team is a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems (for example, business unit or the corporation), and who manage their relationships across organizational boundaries. For example, in a production work team, one member may pass on the product of her work to another member to work on, with all members sharing responsibility for the

quality and quantity of the final output that is produced. In a project team, research and development engineers may work iteratively with manufacturing process engineers to make sure that the designs that are being developed can be manufactured; the team's tentative designs may be reviewed by the research and development and manufacturing functional managers. By this definition, a department of electrical engineers who work on separate projects is not a team. The engineers work independently of each other, do not share responsibility for outcomes, and are not interdependent.

We use the words "team" and "group" interchangeably in this paper, although we more frequently use the term "team." The popular management literature has tended to use the term "team," for example, empowered teams, quality improvement teams, and team effectiveness. The academic literature has tended to use the word "group," for example, group cohesion, group dynamics, and group effectiveness. Groups vary in their degree of "groupness," with some groups being more interdependent and integrated than others. Some authors have used the label "team" for groups that develop a high degree of "groupness" (see for example, Katzenbach and Smith, 1993). This convention is not yet widely shared and thus we do not differentiate in our use of these terms.

Types of Teams

Four types of teams can be identified in organizations today: (1) work teams, (2) parallel teams, (3) project teams, and (4) management teams. Each of these types fits our general definition of a team. Other sources offer slightly different typologies (Katzenbach & Smith, 1993; Mohrman et al., 1995; Sundstrom et al., 1990), but their categories overlap with ours. For example, Sundstrom et al. (1990) differentiate between advice and involvement teams, production and service teams, project and development teams, and action and negotiation teams. Of the categories in our typology, work teams correspond to their production and service teams, parallel teams to their advice and involvement teams, and project teams correspond to their project and development teams. We include a category for management teams and they include a category for action and negotiation teams.

Work teams are the type of team most people think about when discussing teams. Work teams are continuing work units responsible for producing goods or providing services. Their membership is typically stable, usually full-time, and well-defined (Cohen, 1991). Work teams are found both in manufacturing and service settings; examples from the studies we later review include mining crews (Goodman & Leyden, 1991), apparel manufacturing teams (Batt &

Appelbaum, 1995), and audit teams (Gupta, Dirsmith, & Fogarty, 1994). Traditionally, work teams are directed by supervisors who make most of the decisions about what is done, how it is done, and who does it. More recently, an alternative form of work team called a variety of labels — self-managing, autonomous, semi-autonomous, self-directing, empowered — is gaining favor. Self-managing work teams involve employees in making decisions that were formerly the province of supervisors and managers. Typically the members of self-managing work teams are cross-trained in a variety of skills relevant to the tasks they perform. Examples include self-managing engineering workshop teams (Pearson, 1992) and telecommunications teams (Cohen & Ledford, 1994; Batt & Appelbaum, 1995). Companies have implemented self-managing teams to reduce costs, to improve productivity, and to improve quality.

Parallel teams pull together people from different work units or jobs to perform functions that the regular organization is not equipped to perform well (Ledford, Lawler & Mohrman, 1988; Stein & Kanter, 1980). They literally exist in parallel with the formal organizational structure. They generally have limited authority and can only make recommendations to individuals higher up in the organizational hierarchy. Parallel teams are used for problem-solving and improvement-oriented activities. Examples include quality improvement teams, employee involvement groups, quality circles, and task forces. One study we review examines quality circles in an U.S. federal mint (Steel, Jennings, & Lindsey, 1990). Parallel teams have been used for quite some time, but the continuing interest in quality and employee involvement has resulted in the widespread diffusion of this team type.

Project teams are time-limited. They produce one-time outputs, such as a new product or service to be marketed by the company, a new information system, or a new plant (Mankin, Cohen, & Bikson, 1996). For the most part, project team tasks are non-repetitive in nature and involve considerable application of knowledge, judgment, and expertise. The work that a project team performs may represent either an incremental improvement over an existing concept or a radically different new idea. Frequently, project teams draw their members from different disciplines and functional units, so that specialized expertise can be applied to the project at hand. For example, new product development teams often draw their members from marketing, engineering, and manufacturing. When a project is completed, the members either return to their functional units or move on to the next project. In a review of the product development literature, Brown and Eisenhardt (1995) noted that cross-functional teams were found to enhance project success.

Project teams have been part of the organizational landscape for quite a while, with aerospace and defense companies using them since World War II. Their capacity to do multiple activities simultaneously rather than sequentially saves time; consequently, companies are expanding their use of project teams as a response to time-based competition (Stalk & Hout, 1990). Eisenhardt and Tabrizi (1995) found that the use of multi-functional new product teams among 36 computer firms was positively linked to rapid development time.

Management teams coordinate and provide direction to the sub-units under their jurisdiction, laterally integrating interdependent sub-units across key business processes (Mohrman et al., 1995). The management team is responsible for the overall performance of a business unit. Its authority stems from the hierarchical rank of its members. It is composed of the managers responsible for each sub-unit, such as vice-presidents of research and development, manufacturing, marketing, and quality. At the top of the organization, the executive management team establishes the firm's strategic direction and manages its performance. The use of top management teams (TMTs) is expanding in response to the turbulence and complexity of the global business environment. Management teams can help companies achieve competitive advantage by applying collective expertise, integrating disparate efforts, and sharing responsibility for the success of the firm (Mankin et al., 1996).

Effectiveness of Teams

We take a broad approach to effectiveness to include the multiplicity of outcomes that matter in organizational settings. These outcomes occur at several levels: at the individual, group, business unit, and organizational levels. Outcomes can be related to one another in complex and sometimes conflicting ways (Argote & McGrath, 1993). Effectiveness at one level of analysis can interfere with effectiveness at another level. Thus, it is important to be clear about the dimensions of effectiveness that are being considered and the level at which they are being considered.

We categorize effectiveness into three major dimensions according to the team's impact on: (1) performance effectiveness assessed in terms of quantity and quality of outputs; (2) member attitudes (3) behavioral outcomes. Examples of performance effectiveness measures include efficiency, productivity, response times, quality, customer satisfaction, and innovation. Examples of attitudinal measures include employee satisfaction, commitment, and trust in management. Examples of behavioral measures include absenteeism, turnover, and safety. Guzzo & Dickson (1996), Sundstrom et al. (1990), and Hackman (1987) include multiple dimensions in their

definitions of effectiveness, but do not draw attention to behavioral outcomes. We report on study findings using these three dimensions in this review.

Team Effectiveness Framework

Figure 1 presents a heuristic framework for analyzing the effectiveness of teams. In this framework, effectiveness is a function of environmental factors, design factors, group processes, and group psychosocial traits. Environmental factors are characteristics of the external environment in which the organization is embedded, such as industry characteristics or turbulence. Design factors refer to those features of the task, group, and organization that can be directly manipulated by managers to create the conditions for effective performance. Examples of task design variables include autonomy and interdependence. Examples of group composition design variables include size, tenure, demographics, and diversity. Examples of organizational context design variables are rewards, supervision, training, and resources. Processes are interactions such as communication and conflict that occur among group members and external others. Group psychosocial traits are shared understandings, beliefs, or emotional tone. Examples include norms, cohesiveness, team mental models, and group affect. Effectiveness outcomes are the performance, attitudinal, and behavioral indicators that we have already discussed.

Insert Figure 1 About Here

This framework moves away from the "input-process-output" approach (McGrath, 1964) by depicting design factors, which have an indirect impact on outcomes via group processes and psychosocial traits, as also having a direct impact on outcomes. It suggests that group psychosocial traits are real group-level phenomena. These traits directly influence outcomes; they also indirectly influence them through shaping internal and external processes. The framework illustrates that group processes can become embedded in psychosocial traits such as norms, shared mental models, or affective states. Environmental factors, meanwhile, have a direct influence on design factors. Altogether, environmental factors, design factors, internal and external processes, and group psychosocial traits predict effectiveness outcomes. We should note that effectiveness outcomes can reciprocally influence group processes, psychosocial traits that emerge, and even design factors. For example, the composition of TMTs is more likely to change when a firm is performing badly (Hambrick & D'Aveni, 1992). As we later discuss, most studies still do not

address how teams change over time, and subsequently fail to capture the impact of these changes on team effectiveness. For the sake of simplicity, and because most studies we consider here fail to observe the reciprocal relationships that occur between outcomes and predictors over time, we do not graphically represent these relationships in Figure 1.

We use this heuristic framework to help us make sense out of a complex set of relationships and to suggest directions for future work. This framework draws attention to the design factors which are the major points of leverage for influencing team effectiveness. It suggests that critical group processes occur both inside and outside the group. Recent studies of new product development project teams (Ancona & Caldwell, 1992a) focused on the impact of external processes. In contrast, most previous frameworks focused exclusively on internal group processes. The model draws attention to the group as a social entity that has shared psychosocial traits that influence its behaviors. These include constructs that historically have been studied, such as group norms and cohesiveness, and new constructs, such as team mental models or group affect. However, most previous frameworks viewed cohesiveness or norms as group processes, and have not considered more broadly the impact of shared group beliefs, understandings, or emotional tone on effectiveness. Recent conceptual and empirical work has begun to examine the impact of team mental models (Klimoski, 1994; Weick & Roberts, 1993) and group affect (George 1990) on effectiveness.

In the sections that follow, we organize our discussion of research findings by looking at each type of team in turn: work and parallel teams, project teams, and management teams. Within each team discussion, we group results according to the seven categories from our heuristic group effectiveness framework: task design, group composition design, organizational context design, environmental factors, internal group processes, external group processes, and group psychosocial traits. Under each category heading, we use subheadings to indicate the particular variable to be examined. Thus, for example, under the group composition category for work and parallel teams, we use two subheadings: the first for our discussion of studies that investigated diversity, the second for our discussion of those studies that examined size.

Work Teams and Parallel Teams

Work teams and parallel teams are reviewed together in this section due to the limited number of parallel team studies. Table 1 lists the 24 empirical field studies of work teams, divided into 17 general work team studies and seven self-directed work team studies. The four parallel team

studies are listed in Table 2. The combined sample of 28 studies is nearly evenly split between service and manufacturing settings. Most studies examine groups within a single organization, although multiple sites might be included. One quarter of the studies extend their setting to include at least two organizations, with two studies looking at more than one industry (Batt and Appelbaum, 1995; Yammarino & Dubinsky, 1990). Fewer than half the studies consider external factors such as the physical setting or organizational context in which the teams under study are embedded. (This fact can be determined by looking down the column labeled "Organizational Context" in Tables 1 and 2). In fact, environmental factors are considered in only one study (Gupta, Dirsmith, & Fogarty, 1994), and external processes are all but ignored. Five studies (Campion, Medsker, & Higgs, 1993; Vinokur-Kaplan, 1994; Magjuka & Baldwin, 1991; Batt & Appelbaum, 1995; and Cohen, Ledford, & Spreitzer, 1996) test full multivariate models of group effectiveness; the others focus on a smaller number of independent variables. Please note that while we may cite meta-analyses or laboratory work in some of our discussions, Tables 1 and 2, as well as those like them to follow in the other sections, list only primary empirical field studies.

Insert Table 1 and Table 2 About Here

Hackman (1990) stresses the need for more complete descriptions of the technology, task, and product associated with a work group - in his terms, the "stuff" with which the group works. An excellent description of group task and technology can be found in Batt and Appelbaum's (1995) depiction of the work environments of telecommunications and apparel manufacturing groups. In many studies over the past six years, however, such descriptions are often still missing. Basic work group information that should be relayed includes the type of firm in which the team resides, team structure and composition (for example, member job titles, position of the group within the organization, and leader and supervisor roles), type of tasks performed, and the technology and equipment used. These details are essential for the development of a holistic understanding of the work group literature by providing a context for a study's results.

Definition and Measurement of Effectiveness

Recent studies use several outcome measures, with over half employing at least three measures of effectiveness. Nearly half the work and parallel team studies featured objective measures of a team's performance, typically culled from production records. Idiographic

objective measures specific to the task and type of team were captured (for example, technician repair and response times, Wageman, 1995; target shooting rating, Eden, 1990; tons of coal mined per crew per shift, Goodman & Leyden, 1991), with aggregated measures of overall performance generally reported as well. Survey questions focused on perceptions of overall team performance, with responses garnered nearly as often from team members themselves as from managers (each metric appeared in about half the studies). Many attitudinal and behavioral measures were also captured. Most common among these were satisfaction, commitment to the organization, absenteeism, and turnover or intent to leave.

Key Findings

Key findings for work and parallel teams were found in every category in Figure 1 with the exception of external processes, and are discussed here in turn.

Task Design

Work Group Autonomy and Participation. Self-directed work teams and parallel teams are both forms of worker participation. The former feature high levels of group autonomy, and they are an example of substantive participation (Levine & Tyson, 1990) because they require fundamental changes in work organization. Parallel teams such as quality circles typify what Levine and Tyson term consultative participation; suggestions are elicited from workers, but managers retain control over decisions. Worker participation of either form is theorized to enhance performance. Locke and Schweiger (1979) challenged this contention, showing that participation improved satisfaction but not performance. A recent meta-analysis, however, shows that participation has a positive, albeit small, relationship to performance (Wagner, 1994). To this day, the main focus of nearly every study of self-directed work teams and parallel teams has been their impact on effectiveness.

The impact of substantive participation on attitudinal measures in our sample appears to be quite positive. Autonomy was positively associated with satisfaction for self-directed work teams in both manufacturing (Cordery, Mueller, & Smith, 1991; Pearson, 1992; Seers, Petty, & Cashman, 1995) and service (Cohen & Ledford, 1994; Cohen et al., 1996) environments. Weisman et al. (1995) found a measure of participation to be positively related to satisfaction among self-managed nursing units. Autonomy was further found to be positively associated with the attitudinal measures of organizational commitment (Cordery et al., 1991; Cohen et al., 1996) and trust in management (Cohen et al., 1996).

The relationship of substantive participation to behavioral outcomes is mixed. Absenteeism was found to be higher among autonomous teams than traditionally managed ones in one study (Cordery et al., 1991) and relatively stable in another (Pearson, 1992). In the first study, the authors suggest the higher absenteeism may have been caused by the substantial amount of plant overtime and the greater distance its employees had to travel to get to work. The long distance from home to work was also cited as a reason for leaving the firm in employee exit interviews; turnover in that study was higher for the autonomous groups. A somewhat positive behavioral result is found in Pearson's (1992) study of an engineering workshop. Accidents increased among non-autonomous groups while remaining constant for semi-autonomous ones. The latter were observed to include job safety in their discussion periods, while non-autonomous groups relied upon safety representatives to uncover unsafe work practices. Weisman et al. (1995) found that self-managed nurses worked longer hours, which in turn led to higher turnover. However, self-managed nurses earned higher pay than nurses in traditional units, and greater pay improved retention. In general, the behavioral effects of substantive participation are less positive than the attitudinal ones.

Substantive participation generally appears to have positive performance impacts. Autonomy was found to be positively associated with both team-rated (Cohen & Ledford, 1994; Cohen et al., 1996) and manager-rated (Cohen & Ledford, 1994) performance. Weisman et al. (1995) found similar results for their participation measure. Gupta, Dirsmith, and Fogarty (1994) found both personal and group control to be positively related to performance among 96 U.S. General Accounting Office audit teams. Campion, Medsker, and Higgs (1993), in a study of 80 financial services clerical groups, found autonomy to be positively related to productivity. Positive results were not limited to service settings; in a longitudinal study of autonomous and traditionally managed groups that build and maintain locomotives, Pearson (1992) found autonomy to be positively related to productivity, noting that the autonomous groups made more efficient use of their manpower, eliminated unnecessary work, and acquired more relevant work knowledge.

One study found no significant relationship between autonomy and performance. Yammarino and Dubinsky (1990) found autonomy to be positively related to manager ratings of performance for retail sales groups, but not for insurance ones. The two samples differ considerably; the retail sample was less educated, younger, more female, and had less job tenure than the insurance sample. Retail salespeople also had more routine tasks, sold less complex products, and worked

in much closer proximity to their manager than did insurance salespeople. The authors suggest the retail managers may have had a much clearer idea of their subordinates' performance than did the insurance managers, and that this might account for the differing results. Whether the salespeople in both samples were in "real teams" is debatable. The groups were collections of individuals who seemed to lack any collective responsibility (sales performance was measured for individuals); they simply reported to the same manager. In fact, the results discussed here were found at the individual level of analysis; for the most part, they did not hold at the group level.

Consultative participation did not fare as well as substantive participation. Adam's (1991) longitudinal study of four quality circles in two manufacturing and assembly plants revealed a negative relationship between participation and satisfaction. In his study, quality circles did not exhibit greater satisfaction than control groups, and satisfaction for both declined over time. Adam's results are similar to those of past studies; Griffin (1988) found initial satisfaction gains among quality circle members to decrease within 18 months and to disappear after three years, while Marks et al. (1986) found no improvement of quality of work-life attitudes among quality circle members in a longitudinal study. Steel et al., (1990) found that managers' ratings of performance were no higher for quality circle employees than for non-circle employees at a U.S. federal mint, but that circle participation was negatively associated with absenteeism. They suggest the lack of positive performance results might be due to success-inhibiting factors associated with government settings. For example, since the mint's director was a political appointee, rank-and-file workers may have chosen to "wait out" the current leadership's quality circle program. They also note that quality circle training may have been inadequate. The only positive result for consultative participation in this group of studies is a behavioral one.

Batt and Appelbaum (1995) conducted the only study in which consultative and substantive participation were directly compared. They examined work groups in two industries: telecommunications and apparel. At all sites, both traditionally managed and autonomous work groups were employed. In addition, workers could participate in off-line, consultative teams such as quality of work life teams and training committees. In models predicting satisfaction, organizational commitment, and workers' perceptions of quality, consultative participation was never significant for telecommunications workers, while for sewing operators it had a mildly significant effect only on organizational commitment. Substantive participation was always significant for both samples. It remained a significant predictor of workers' ratings of quality even

after the model controlled for a full array of human resource and employment relations practices. Substantive participation thus proved a superior positive predictor of outcomes than did consultative participation.

Overall, recent studies indicate that substantive participation in the form of self-directed work teams has clear benefits. Worker autonomy enhances worker attitudes, behaviors, and performance (whether measured objectively or rated subjectively by team members). In contrast, the largely negative results for consultative participation suggest that it lacks such benefits. The studies of the past six years tend to be consistent with the findings of recent reviews that examined the literature of the past thirty years. In a meta-analysis of 131 North American field studies involving organizational change, Macy and Izumi (1993) determined that autonomous and semi-autonomous teams had a significant effect on an organization's financial and overall performance while other team configurations (quality circles, general work teams, and employee involvement teams) did not. Although the particular meta-analysis technique employed by the authors was highly exploratory, their results are similar to those of Cotton and colleagues (1988, 1993), who in their surveys found that self-directed work teams have had a stronger effect on performance than have parallel teams.

Is Team Autonomy a Form of Control? Gryzb (1984) questioned managers' motivation in creating work teams and autonomous work groups, suggesting that the managers' aim was not only to boost productivity but also to erect new structures of control over the workforce. His contention has been followed in the past six years with a trio of articles that question the benefits of teams and autonomy. Sinclair (1992) presents an argument for how groups use their new-found power to coerce and tyrannize members into following established group methods and norms. Barker (1993) provides evidence of such behavior in his ethnographic account of norm creation and enforcement among groups in a small manufacturing company. He refers to the group's actions as a form of concertive control by which group norms (for example, "we all need to be to work on time") evolve into group rules (for example, if you're more than 5 minutes late, you're docked a day's pay") that are strictly enforced (Barker, 1993: 428). These observations suggest that more work is needed to examine the link between autonomy and norms. While no large-scale field studies have been performed, an analysis of 90 ethnographic cases provides partial support for Barker's finding: team organization of work increased group discipline, albeit autonomy specifically had no effect (Hodson et al., 1993). Coming from a different stance, Klein (1991)

argues that modern manufacturing practices such as just-in-time inventory policies may preclude group autonomy. Klein conceptualizes autonomy primarily in terms of control over the pace of work. She concludes that decision-making power may need to be shifted from the work group level to higher levels such as workshifts or departments. Her premise should be reexamined in light of the full range of decision-making autonomy available to work groups (see Bailey, in press).

Interdependence and other task characteristics. Wageman (1995) studied interdependence in a quasi-experiment involving 150 Xerox equipment maintenance technician groups. Three conditions were created for how technicians performed their tasks: individual (no collective decision-making, completely individual responsibilities), group (no individual assignments, collectively make decisions for work processes and share responsibility for repair calls), and hybrid (a mixture of individual and collective responsibilities). Similar conditions were created for how managers distributed rewards: based on individual outcomes, group outcomes, or sometimes individual outcomes, sometimes group ones. Groups with moderate levels of interdependence were found to be those with hybrid tasks or hybrid rewards, and those groups performed worse than groups with either highly interdependent or highly independent designs. In fact, even groups with mixed designs (individual tasks with group rewards or group tasks with individual rewards) resulted in better performance than all hybrid task and reward combinations. An interdependent task design proved better than individual or hybrid ones in facilitating internal processes like cooperation and learning.

Beyond interdependence, several studies examined task characteristics using Hackman and Oldham's (1975) job design characteristics of autonomy, feedback, significance, identity, and skill variety. Ganster and Dwyer (1995), in a study of white-collar and blue-collar work groups, found these task dimensions to positively predict organizational commitment but not manager ratings of performance. The task characteristics were found to be positively associated with manager ratings of performance and satisfaction in Campion et al. (1993), and with satisfaction, organizational commitment, team-rated performance, and trust in management in Cohen et al. (1996). Batt & Appelbaum (1995) found job design characteristics to significantly improve workers' job satisfaction and organizational commitment. Recent research thus confirms and extends what we know about the impact of job design variables on work group effectiveness.

Group Composition

Diversity. Only two studies examined diversity; both studies conceptualized it in terms of knowledge and skills. Magjuka and Baldwin (1991) measured heterogeneity as the proportion of various job categories within computer manufacturing employee involvement teams. Teams with greater diversity evaluated their effectiveness more positively. The authors offer a number of possible explanations for this result, ranging from better use of member knowledge to better communication and cooperation with external groups. Campion et al. (1993) found skill heterogeneity to have no relationship to productivity, employee satisfaction, and manager ratings of performance in a service setting. They suggest that their sample may have varied little in terms of background and expertise.

Size. Past research suggests that size has a curvilinear (Steiner, 1972) or inverted U-shaped (Nieva, Fleishman, & Reick, 1985) relation to effectiveness such that too few or too many members reduce performance. Two studies in our sample found that increasing group size actually improved performance without limit. Campion et al. (1993) found that group size was positively related to productivity, manager judgments of effectiveness, and employee satisfaction. Groups in that study ranged from 6 to 30 members (average size 15); their clerical jobs involved processing paperwork for sales units. In a study of 72 employee involvement teams in two manufacturing firms producing electronic equipment and hand-held tools, Magjuka and Baldwin (1991) found group size to be a significant positive predictor of group performance among employee involvement teams. Team size ranged from 8 to 46 members; the teams focused on continuous improvements. The authors note the benefits of increasing team size: larger teams imply fewer teams within a firm, thus fewer leaders must be trained, less coordination is required among teams, and fewer team proposals must be reviewed by steering and oversight committees. In a third study, Martz, Vogel, and Nunamaker (1992) found that absolute group size was not correlated with group performance among computer manufacturing groups using group decision support software. However, their study did not control for other variables; larger groups also tended to draw members from a greater number of functions and to consist of more managers than did smaller groups. Vinokur-Kaplan (1995) had the only negative result; group size was a negative predictor of performance among 15 interdisciplinary hospital teams (sizes 5 to 12) that prepared patient psychiatric treatment plans.

These studies lie in contrast to the considerable body of work conducted on group size. Yet, their implication, namely that the U-shaped relationship between size and effectiveness may not

hold for all types of teams in organizational settings, may be worthy of further investigation. For example, how do parallel teams with 46 members operate? Are they successful because they split up into smaller sub-groups, each of which tackles a portion of the larger team task, or are they able to work effectively as a single unit? Such questions should be answered before designing parallel team programs that feature teams of such large size.

Organizational Context

Rewards. The results for rewards are somewhat mixed. Rewards were found to have no significant relationship with manager ratings of performance (Campion et al., 1993; Magjuka & Baldwin, 1991; Cohen et al., 1996), team ratings of performance (Magjuka & Baldwin, 1991), productivity (Campion et al., 1993), and process effectiveness (Wageman, 1995). Only two studies found any positive relationships between rewards and some form of effectiveness. Cohen et al. (1996) found that management recognition was positively associated with team ratings of performance, trust in management, organizational commitment, and satisfaction for both self-directed and traditionally managed groups in a telecommunications firm. When joined with the other contextual variables (information access, training, resources, and feedback), it proved a strong positive predictor of manager ratings of performance for self-directed work groups. Wageman (1995) found that the highest performing maintenance technician groups were those whose rewards and tasks had either pure group or pure individual designs (see discussion of interdependence). Collective rewards helped motivate groups whose tasks were made interdependent, while individual rewards did the same for members of groups whose tasks reflected purely individual responsibilities. This study clearly showed the importance of designing rewards in consort with the task.

Supervision. Supervisor behaviors, moods, and expectations were studied for their effect on group performance. Cohen, Ledford, and Spreitzer (1996) examined encouraging supervisory behaviors (for example, behaviors that encouraged self-criticism, self-rehearsal, and self-management) among self-directed work teams and traditionally managed teams. Contrary to Manz and Sims' self-leadership theory (1987), encouraging supervisory behavior was a negative predictor of performance for self-directed work groups. Several possible explanations are posed: supervisors may tend to exhibit encouraging behavior with groups management knows are performing poorly but not those that are performing well; supervisors may actually obstruct high performance when they interfere with self-managing work teams; or upper management may

perceive that groups that receive ("need") such help to be struggling. Encouraging behaviors had no significant relationship to outcomes for traditionally managed groups, perhaps because they are accustomed to supervisory direction. These results, in conjunction with Beekun's (1989) meta-analysis finding that self-managing work teams without supervisors performed better than those with supervisors, imply that more work is needed in regard to leading self-managed teams. In another study of supervisor behaviors, Brewer, Wilson, and Beck (1994) found that police sergeants of higher-performing teams spent significant amounts of time monitoring team performance. Higher performance was associated with supervisors who spent less time in their cars patrolling and more time at their desks doing paperwork. The authors suggest that time spent on problem analysis and planning may be a more effective deployment of supervisor resources than joining officers in patrol duties.

A supervisor's positive mood was found to positively predict prosocial behavior (here, the provision of customer service) and negatively predict turnover for sales groups in 33 department stores (George & Bettenhausen, 1990). In a related study, George (1995) found that the sales manager's positive mood was positively related to customer service behavior among 53 retail sales groups. It is not clear through which mechanisms the leader's mood affected the group's performance. The leaders' positive moods may have been contagious to group members, or perhaps leaders in good moods engaged in behaviors that supported groups. Causation is also not clear; effective groups may cause leaders to be in good moods. However, it does appear that the effects of leader positive mood are independent of potential confounding effects caused by the leader's job satisfaction and job involvement (George, 1995).

In addition to leader affect, leader cognitions in the form of expectations were found to affect group performance in a study by Eden (1990), who reported a Pygmalion effect among military platoons. Platoons whose training leaders were told their groups had high potential performed significantly better than control platoons over a 10-week training period. Eden showed that the relationship held for entire groups, not just for individuals as in previous research.

Environmental Factors

Client Climate. Only one study of work groups examined environmental factors. Gupta et al. (1994) united contingency and institutional theories to explain the simultaneous presence of bureaucratic, group, and personal modes of work-unit control in the U.S. General Accounting Office (GAO). When auditing government agencies that operate in institutionalized settings, the

GAO was found to ceremonially adopt more bureaucratic modes of control for its audit team. Institutional theory implies that to do so helps the GAO to appear more rational in the eyes of the audited agencies. However, because audits in highly institutionalized settings were characterized by greater task difficulty and high member and supervisor interdependence, contingency theory correctly predicted that more social forms of work-unit control, such as group or personal modes, would be chosen behind the scenes to coordinate and control audit team activities. The study clearly demonstrates how environmental factors can alter task design characteristics.

Internal Processes

Conflict. Previous work on group-level conflict has been conducted primarily in laboratory experiments with undergraduate students (for example, Wall & Nolan, 1987; Wall, Galanes, & Love, 1987). One large-scale study in our sample examined conflict in the field. Jehn (1995) surveyed 79 work groups and 26 management teams in a large freight transportation company. She separated conflict into two types: relationship conflict (interpersonal incompatibilities, tension, animosity, and annoyance) and task conflict (disagreement among group members about task content). For groups performing routine tasks, task conflict proved to be detrimental to group processes. However, in those groups performing non-routine tasks, task conflict was not detrimental; in fact, in some cases it was beneficial. Here, task conflict appeared to promote critical evaluation of problems and options while simultaneously reducing thoughtless agreement. The benefits of task conflict did have their limits; at high levels of conflict, members became overwhelmed with information and lost sight of the group goal. Relationship conflict was detrimental to satisfaction and to members' intent to remain in the group regardless of the type of task, but it had no impact on performance. It appears that group members simply avoided those people with whom they did not get along. It is no surprise, then, that interdependence increased the negative impact of relationship conflict.

Collaboration. Vinokur-Kaplan (1995) found collaboration to be a positive predictor of interdisciplinary hospital treatment team members' perceptions of their overall effectiveness and individual well-being. Interestingly, however, collaboration did not predict their perceptions of how well the team met the hospital standards of quality, quantity, timeliness, and implementation, which together constituted a more specific, task-oriented measure of performance. Because collaboration also positively predicted team cohesion, it may be that the teams interpreted the overall measure more in terms of their internal processes than in terms of external performance

demands. Seers, Petty, & Cashman (1995) measured "team-member exchange" with a ten-item scale that mixed communication and collaboration items measuring internal coordination. Departments with higher team-member exchange had significantly higher efficiency as captured from archival records. Neither study examined the moderating impact of interdependence.

Group Psychosocial Traits

Cohesiveness. In the past six years, four meta-analyses of cohesiveness have been conducted using both laboratory and field findings. Two studies (Evans & Dion, 1991; Mullen & Copper, 1994) found a moderately strong positive relationship between cohesion and performance; in the former, however, the sample was biased by sports teams, where performance criteria are obvious and logical (for example, win-loss records) and members are unlikely to question goals. Obviously, such situations would not hold for many groups in organizations. Both studies were criticized by Gully, Devine, and Whitney (1995) for either failing to account for the level of analysis (group versus individual) or failing to account for task interdependence. Taking these two factors into consideration, Gully et al. (1995) confirmed a positive relationship between cohesion and performance, noting that the effect was larger in studies using a group level of analysis than it was in those with an individual level. Task interdependence also proved a moderator, with highly interdependent tasks showing a larger effect. The authors note that many studies lacked sufficient detail of task interdependence in groups, forcing them to employ a simple high-low categorization. They also recommend that future studies examine different types of cohesion (for example, task versus social) as well as the possible moderating effect of group goals. Mullen et al. (1993) conducted the fourth meta-analysis to examine the impact of cohesiveness on group decision-making quality. They found that the more the operationalization of cohesion tapped into interpersonal attraction, the more cohesiveness impaired group decision-making. Additionally, cohesiveness tended to impair the quality of decision making as group size increased.

In addition to the meta-analyses, several primary empirical field studies (not included in the meta-analyses) have examined group cohesiveness in the past six years. Vinokur-Kaplan (1995), in a large-scale test of Hackman's (1987) model of group effectiveness, found that cohesion proved a positive predictor of hospital treatment team performance. Cohesiveness was also a positive predictor of customer service behavior among 33 retail sales groups (George & Bettenhausen, 1990), but it did not predict their voluntary turnover. The authors suggest that the strong position of the group leader, and the overriding importance of each group member's relation

to the leader in comparison to her relation to other group members, may have lessened the impact of cohesiveness on turnover. In this setting, as in that of Yammarino and Dubinsky (1990), there is again the question of how "group-like" is a collection of sales clerks whose group leader is the store manager. However, questions regarding cohesiveness and prosocial behavior were posed in reference to the store as a whole, not in terms of the individual respondent, and responses were checked for consistency within the group using James, Demaree, and Wolf's (1984) estimate of interrater reliability with satisfactory results. Finally, Seers et al. (1995) found cohesiveness to increase over time among autonomous groups while decreasing (albeit not significantly) for traditionally managed ones. Team cohesiveness had a moderately significant positive correlation to departmental efficiency in that study. The findings from these three primary studies are consistent with the meta-analytical conclusion that cohesion is positively related to performance.

Norms. Norms are standards shared by group members (Steers, 1981), which when crystallized, that is highly agreed upon by group members, permit the group to regulate member behavior (Jackson, 1965; Cohen, 1994). Cohen et al. (1996) found group performance norms to have strong positive associations with team ratings of performance but not with manager ratings. In addition, they found norms to be positively related to the attitudinal measures of organizational commitment, trust in management, and satisfaction, but not to the behavioral measure of absenteeism. Norms reflecting the acceptance of conflict within a group were examined by Jehn (1995). She found that norms promoting an open and constructive atmosphere for group discussion enhanced the positive effect of task-based conflict on individual and team performance for 79 work groups and 26 manager groups. Members of high-performing groups commented that they were not afraid to express their ideas and opinions. For relationship-based conflict, groups with conflict avoidance norms had higher satisfaction and member liking than those with openness norms. In these instances, openness did not promote acceptance and forgiveness, but instead facilitated escalation of conflict and viciousness. Here, the impact of a norm on effectiveness is shown to depend both on its content and its context.

*Affect***.** George (1990) hypothesized that if the attraction-selection-attrition framework of Schneider (1987) implied that people with similar personalities will tend to be attracted to, selected by, and retained in a given work environment, then work groups might logically possess a shared affective tone, which could be either positive or negative. This shared tone of the group might then affect the group's performance. George found consistent affective tones within 26 retail

sales groups. Negative affective tone was a significant negative predictor of customer service behavior; positive affective tone was negatively associated with absenteeism. While the article set off a debate in the literature regarding the statistically appropriate method for aggregating individual-level data to the group level of analysis (see Yammarino & Markham, 1992; George & James, 1993; Klein, Dansereau, & Hall, 1994), the important contribution this study makes is the shifting of attention to group personality traits that might explain group behaviors, attitudes, and performance. While field studies in this realm are few in number, recent experimental work has shown that moods can affect judgments in group discussion tasks (Forgas, 1990), while models on the role of affect in work groups are being developed (Rhoades & O'Connor, 1996). However, much of the work on affect and mood remains at the individual level.

*Cognition***.** The work on group cognition is similarly in its early stages. Weick and Roberts (1993) discuss the existence of a collective mind among crews on aircraft carrier flight decks. Collective mind is defined not as the sum of individual knowledge, but rather as the interrelation of actions carried out within a representational understanding of the system. This understanding is developed by each actor in the system. The more heedful the interrelating of actors, the more developed and capable the collective mind. The idea of a collective mind is also present in Wegner's (1986) concept of transactive memory. Shared experiences may lead groups to code, store, and retrieve information together. The memory is not only the sum of individual memories, but also the awareness of who knows what. In a laboratory experiment, Liang, Moreland, and Argote (1995) documented the creation of a transactive memory through group training. Groups that were trained together in a radio assembly task produced higher quality radios than groups whose members were trained alone. Group members specialized in remembering distinct aspects of the assembly procedure, coordinated their efforts smoothly, and trusted one another's knowledge about assembling the radio. Neck and Manz (1994) also consider group cognition and the idea of a group mind; they prescribe theoretical conditions for encouraging constructive synergistic team thinking and avoiding Janis' (1972) groupthink. Early evidence that group cognitions may affect group attitudinal and behavioral measures is provided by Zimmermann (1994), who studied communication-related construct systems among hospice team members. She found that team members with more complex interpersonal construct systems were less satisfied with team communication and more willing to leave the team than those members with more

simple systems. Future work should continue to map out the relationships between group cognitions and group effectiveness.

Project Teams

Thirteen studies of project teams are included in this review (see Table 3). Among them, the majority occur in high-technology manufacturing environments. Over 40% of the studies reflect an external focus. As a result, we see attention paid to variables such as external communication and group external activities, which were almost universally ignored in the work and parallel team sample. This external focus is not surprising, because members of project teams frequently represent different departments and coordination with home departments is important. The external focus is also in keeping with earlier work on project teams; for example, Allen (1977) and Katz and Tushman (1979) examined the transfer of information across project team boundaries.

Insert Table 3 About Here

Frequently missing from the project team studies we examined were in-depth team descriptions. The features that should be described to better understand study results are: 1) type of organization; 2) the organizational structure in which the project team is embedded; 3) the functions represented on the team; 4) the percentage of time that members are dedicated to the team; 5) the leadership structure; and 6) the nature of the product to be designed, for example, the degree of innovation expected. A few studies provide descriptions of project team structures (for example, Clark and Wheelwright, 1992; Durand, 1995; Nadler and Tushman, 1988; Olson, Walker, and Ruekert, 1995). Clark and Wheelwright's (1992) typology may be of considerable benefit when describing a team's leadership structure by differentiating a "heavyweight" (a senior person with budgetary control and reporting authority over the team) from a "lightweight" (a junior person with little control over the team). These features should be described in the background section on any study of project teams to enable interpretation of the study's results.

Definition and Measurement of Effectiveness

The most frequently used measure of project team effectiveness in this sample was external perceptions garnered from managers or supervisors; internal team perceptions were the next most common, with external perceptions from customers or other stakeholders the least frequently used

measure. In contrast to the work and parallel team sample, no study in this sample used objective measures of the team's performance, albeit managers may have been asked to consider these in their survey ratings. Managers were commonly asked to rate a team on five measures of performance: (1) adherence to budgets, (2) adherence to schedules, (3) innovation, (4) project quality, and (5) overall performance or efficiency. Team questions generally mirrored those asked of managers. Additional items included member satisfaction (Ancona, 1990; Pinto, Pinto, & Prescott, 1993) and affective cohesion (Ancona, 1990; Ancona & Caldwell, 1992a). Only two studies examined external perceptions of customers or stakeholders; they measured overall performance/efficiency (Ancona, 1990 and Henderson & Lee, 1992) and time to complete the project (Henderson & Lee, 1992).

Key Findings

Key findings for project teams are found in the areas of task design, group composition, internal processes, external processes, and group psychosocial traits.

Task Design

Autonomy. While autonomy was associated with higher performance among work teams, it is not found to be so among project teams. Henderson and Lee (1992) compared team control with managerial control among 41 information systems design teams across 10 organizations. Team members included information systems design professionals as well as customer representative professionals from the functions or businesses where the final systems were to be implemented. The highest performing teams were those in which managers retained control over assigning specific work assignments to team members and developing task procedures. Similarly, Kim and Lee (1995) found that team autonomy had a negative association with performance among 80 R&D teams in both government-sponsored research institutes and private R&D centers in Korea. Autonomy had a positive impact on the team's performance only when the organizational climate favored innovation and work pressure was high. In a survey of 378 project team members at three R&D facilities in the electronics industry, Levi and Slem (1995) found that self-management was not significantly related to team members' perceptions of team effectiveness. Most respondents reported that their team leader had retained control over most decisions, and most believed their leaders performed well. Further, leadership was found to be strongly correlated with perceptions of team effectiveness. Eisenhardt and Tabrizi (1995) found that project leader power (whether the project manager reported to the business unit manager) was associated with fast product

development time. Ancona (1990) found that in the beginning stages of a state educational program involving five consulting teams, management was unclear about team goals but claimed teams had autonomy. In that initial environment, more active teams fared well. However, when management later became more clear in its aims and set constraints on what the teams could do, an active team that tried to fight this sudden imposition of external control was branded a "trouble" team and was rated poorly by the managers. In each of these studies, project teams with higher autonomy were not the best performers.

Why is team autonomy not a positive predictor of project team performance? Kim and Lee (1995) suggest their results might stem from the cultural disposition of Koreans, who in comparison to Westerners are more accepting of hierarchical arrangements and more risk-adverse, and thus less comfortable with autonomy. Also, Korean government centers tend to produce less innovative work (and therefore work that may be perceived as less successful) than do the private institutes for a number of organizational reasons (such as little competition for funds and long project time spans) that are independent of autonomy. Teams with the highest autonomy scores were found in the government centers, so it may be that the public-private dichotomy explains this result. In interviews with team members, Henderson and Lee (1992) found that members appreciated the manager's ability to bring domain knowledge to bear in work assignment and procedure clarification. In these tasks, both a technical and a social perspective is required; the implication is that managers have both perspectives while team members lack the latter.

Uhl-Bien and Graen (1992) argue that self-management is appropriate for multi-disciplinary project teams. Ancona (1990) suggests that teams may be able to configure their own autonomy by helping to shape definitions of task and performance in their work. Yet, the results of the empirical work reviewed here suggest that autonomy in some cases is neither a desired nor a beneficial characteristic of project teams. It may be that the professionals who typically populate project teams enjoy discretion in other aspects of their work, while lower-level employees generally found on work teams do not. This difference may explain the conflicting findings for autonomy. Perhaps project team autonomy is only important to the project leader, whose name may be prominently associated with the project's success or failure. Hansen (1995), in an exploratory six-month study of a product development team within a high-technology manufacturing firm, observed the project leader to consistently frame his communications to external managers in such a way as to keep them at bay. For example, he put a positive spin on

negative events to keep higher level managers from discontinuing the group's activities. He also did not report conflicts within the group; he felt that doing so would diminish the team's professional image. Future studies might examine how autonomy (and the desire for it) manifests itself among project team members and leaders.

Product Characteristics. Because so many project teams are involved in product development, product characteristics may be expected to have an impact on task design and, ultimately, team performance. Emmanuelides (1993) includes product characteristics in his model of product development performance. He proposes that the newness of the product and the complexity of the product will both be associated with longer development time due to the increased information processing they will engender. Three studies in this sample examine aspects of newness or complexity; however, each does so in relation to how well team design and team processes match or fit these product characteristics.

Olson, Walker, and Ruekert (1995), in a study of 45 new product development projects, found that the less experience project members had with the new product concept, the greater the difficulty they encountered in the development process. This increase in difficulty was associated with higher perceived interdependence among the various functional areas involved on the project, which in turn was associated with higher information flow. The increased flow of information was associated with greater reliance on less formal project coordination structures. Thus, more mechanistic and hierarchical coordinating mechanisms were used when the experience with a product concept was high, while looser, more autonomous structures (like design teams and design centers) were employed when experience was low. Projects where the coordination mechanism fit the newness of the project resulted in products that were higher in quality, were more likely to achieve sales objectives, and reached their break-even point sooner than those projects whose coordination mechanisms were too bureaucratic or too informal given the newness of the product.

Keller (1994), in a test of contingency theory, examined the fit between a project team's level of task technology nonroutineness and amount of information processing. Among 98 R&D groups, this fit was found to be the best predictor of project quality, but did not predict budget-schedule performance. Keller also examined the fit between a technology's unanalyzability and the amount of information processing carried out by the project team. This second measure of fit predicted neither project quality nor budget-schedule performance. Keller suggests that R&D scientists and engineers are trained in procedures for analyzability, such that the degree of unanalyzability may

not constitute a salient variable for the project teams they populate. Nonroutineness, however, directly affects the amount and kind of information that must be processed in order for a team to be successful.

A third type of fit was examined by McDonough and Barczak (1992). They found that technological familiarity had no direct association with how quickly a product was developed in a study of 32 new product development teams. However, familiarity did moderate the relationship between the speed of development and the cognitive problem-solving orientations of both the team and the leader (this relationship is discussed more fully under the group psychosocial traits section).

Combined, these three studies indicate that product characteristics must be taken into consideration when determining how to coordinate and supervise team activities. They further suggest that a team's problem-solving approach and information processing should be matched to the characteristics of the product it is developing. When team design and processes are properly fit to product characteristics, performance can be high, but when they are not so, performance will suffer.

Group Composition

Diversity. Two studies examined the effect of diversity on performance. Eisenhardt and Tabrizi (1995) found that functional diversity was associated with faster time-to-market for new product development efforts in the computer industry. They argue that functional diversity enables development steps to be integrated, linking technical, marketing, and manufacturing activities. Ancona & Caldwell (1992b) looked at organizational tenure diversity and functional diversity among 45 new product teams in five high-technology companies. They hypothesized that the multiple experiences and perspectives represented by tenure diversity would be an advantage. They also hypothesized that functional diversity should facilitate a team's ability to interact across team boundaries to members' home departments, consequently having a positive effect on performance. They discovered that the two types of diversity did not effect performance via the same group process variables. Tenure diversity was positively related to internal task processes, which in turn were positively related to team members' ratings of their own performance. Functional diversity was positively related to external communication, which in turn was positively related to managers' ratings of team innovation. It appears that managers may be less aware of a team's internal processes and more aware of its level of external communication, while

team members assess themselves more on how well they work together as a team. That functional diversity failed to be associated with internal task processes may be due to what Dougherty (1992) describes as the different "thought worlds" they inhabit. The technical, field, manufacturing, and planning personnel typically found on new product development teams have differing paradigms through which they interpret their work. Dougherty suggests that these separate thought worlds create interpretative barriers that inhibit innovation.

An even more surprising result of Ancona and Caldwell's study is that the direct relation between each of the diversity measures and performance was negative. These direct negative effects were stronger than the mediated positive ones. Ancona and Caldwell offer several explanations for their result. Among the more interesting is the suggestion that diversity allows downstream activity to be played out earlier in the development process, that is, on the team. This idea is also put forth by Imai, Ikujiro, and Takeuchi (1985), Gold (1987), and Eisenhardt and Tabrizi (1995). In such a case, the team may appear to be less efficient in the short run, but may in the long run prove a better performer. A less heartening interpretation, which the authors also offer, is that high diversity prevents social integration and cohesion from forming on the team. In their absence, team members are unable to effectively process information. Clearly, longitudinal studies are needed to provide answers to the questions raised by these studies.

Internal Processes

Cooperation, Communication, and Task Process. Little work has been done on the internal processes of project teams, so we discuss the major variables together. Pinto and Pinto (1990) examined the effect of cross-functional cooperation in hospital project teams on team members' ratings of performance. Their measure of cooperation combined affective and cognitive elements. Cooperation positively predicted both task and psychosocial outcomes. Teams high in cooperation relied more heavily on informal modes of communication than did low cooperation teams. In a related study, Pinto, Pinto, and Prescott (1993) found cooperation to be a positive predictor of member satisfaction. Ancona and Caldwell (1992a,b) defined task process as the group's ability to develop plans, define goals, and prioritize work. In both studies, task processes were positively associated with team ratings of overall efficiency. In fact, no study in our sample found internal processes to be negatively associated with team perceptions of effectiveness. And only one study (Keller, 1994, in regard to internal communication) found an internal process to be positively related to managers' assessments of performance.

External Processes

Communication. A significant amount of attention has been paid to a project team's external communication activities in the past six years. Ancona and Caldwell (1992a), building on the earlier work of Allen (1977), Katz and Tushman (1979), and Malone (1987), classified a group's external-focused activities into four major types. "Ambassador" activities involve frequent communication with managers above the team in the organizational hierarchy as the team lobbies for resources and seeks protection and support. "Task coordinator" activities are carried out to coordinate technical or design issues, and are often conducted laterally across the organization. "Scouting" activities are conducted to scan for ideas regarding the competition, technology, or the market in general, and are aimed at specific functions within the firm such as sales and marketing. The fourth type of activity is "guarding," performed to prevent the release of information to external others; communication of this nature has an external focus but is conducted internally within the team. Ambassador and task coordinator activities were found to be positively related to managers' ratings of performance among 45 new product teams. Excessive scouting on the part of the teams was negatively related to these outcomes. It is not clear, however, that scouting activities necessarily involve direct communication with external others. Among the four items included in the scouting factor are "find out what competing firms or groups are doing on similar projects," "scan the environment inside or outside the organization for marketing ideas/ expertise," and "scan the environment inside or outside the organization for technical ideas/ expertise" (Ancona & Caldwell, 1992a: 641). Only the fourth item, "collect technical information/ideas from individuals outside of the team," specifically mentions contact with other persons.

In a related study, Ancona and Caldwell (1992b) found external communication (measured here as a simple frequency variable) to be positively associated with managers' ratings. Keller (1994) had similar results among 98 R&D groups. In fact, no study found external communication to be negatively associated with managerial assessments of team performance. External communication did not appear to be similarly positively associated with a team's rating of its own performance. Rather, it was found to be negatively associated with a team's assessment of its overall performance (Ancona & Caldwell, 1992a,b) and with its ratings of affective cohesion among team members (Ancona & Caldwell, 1992a).

Two studies investigated the antecedents of external communication. Ancona (1990) found that team leader strategies had an impact on the types and frequency of external communication that

was carried out. Education consulting teams whose leaders' strategies were to probe the school districts to discover school needs conducted more site visits and interacted more with the education department's commissioner's office than did teams who took less proactive strategies of parading (letting the districts know the team cared about them) or informing (relaying information about the team's intentions to the school districts). Probing teams were rated highest by department managers. Griffin and Hauser (1992) examined the communication patterns of two differently structured product development teams. One team practiced phased review wherein the project was handed off from department to department. The other team employed quality function deployment (QFD) techniques in a cross-functional arrangement. The phased review process elicited much more hierarchical external communication, while QFD led to more lateral external communication. The study did not measure the effectiveness of the two groups, thereby precluding conclusions regarding performance. Nonetheless, both structure and leader strategies appear to influence external communication.

Group Psychosocial Traits

Cognitive Problem-Solving Orientation. McDonough and Barczak (1992) examined the interplay between a leader's cognitive problem-solving style, a team's cognitive problem-solving style, the familiarity of the technology, and the speed with which teams developed new products. Cognitive problem-solving style was described as being either adaptive (conforms to commonly accepted procedures) or innovative (searches for novel solutions). When the technology was familiar, an innovative style on the part of the team as a whole led to faster development; the leader's style was not a significant predictor. However, when the technology was unfamiliar, a less adaptive approach on the part of the leader led to faster development; in these cases, the team's style was not important. The authors suggest that in familiar technological situations, leaders can withdraw more from the team, letting them direct themselves. But when the technology is unfamiliar, a less adaptive leader ensures that the team has the freedom to consider alternative ideas.

Management Teams

All the studies except for one that we review are of top management teams (TMTs). Korsgaard, Schweiger, & Sapienza (1995) was the only study of intact management teams that headed up business units but were not the top executive team in the firm. The interest in TMTs

reflects the perspective of strategy researchers who conduct the vast majority of these studies. Most of these researchers have adopted the "upper echelons" paradigm which argues that it is the TMT and not just the CEO that has the responsibility for developing and implementing strategies that strengthen organizational performance (Hambrick & Mason, 1984).

These strategy researchers typically define TMTs in terms of their composition and obtain their information on members from Dun and Bradstreet's reference book of corporate management. Who is considered to be a member of the TMT varies somewhat between studies, with some including a broader set of top managers than others. For example, those using Dun and Bradstreet's reference book define TMTs in one of the following ways: (1) all of the officers in the firm (Hambrick & D'Aveni, 1992; Jackson et al., 1991; Lant, Millikin, & Batre, 1992); (2) all corporate officers who are also board members (Finkelstein & Hambrick, 1990; Halablien & Finkelstein, 1993); (3) all officers above the level of vice-president (Schwenk, 1993); (4) all officers above the level of vice-president and any other officers on the board of directors (Michel & Hambrick, 1992); and (5) the two highest executive levels in the firm (Weirsema & Bantel, 1992).

The problem with using position title from an archival source as the method of identifying TMTs is that the degree to which the TMT is a "real team" is impossible to determine. Executives with titles of vice-president or above may or may not be interdependent with one another, may or may not have shared goals and mutual accountability for the firm's performance. In reality, many of the TMTs from the studies we review may not fit our definition of teams, but there is no way to tell from what is reported. We have included them in our review, because a couple of studies suggest that they are "real" teams and we believe that much can be learned about management teams and teams as a whole from this body of work.

Jackson et al. (1991) conducted a study in bank holding companies that dealt with the problem of identifying TMTs from archival sources. It attempted to verify that team members listed in Dun and Bradstreet constituted a co-acting team by contacting 25% of the firms in their sample and asking them how often team members formally met. Replies indicated that 46% met weekly, 42% met once or twice a month, 4% met quarterly, and 4% met annually. The results were promising in that they suggested that 88% of the executives identified through Dun and Bradstreet as members of a firm's TMT met at least once a month. However, the generalizability of these findings to TMTs of companies in other industries is unknown. More importantly, meeting

once a month may be for the purpose of sharing information and may not indicate whether the TMT is a "real team."

A few researchers do not rely on archival data to identify TMTs but instead contact CEOs and ask them to identify TMT members. This approach is generally used for studies that focus on strategic decision-making. The CEO is asked who usually participates in strategic decision-making (Bantel, 1994) or who participated in making specific strategic decisions (Amason, 1996; Shanley & Correa, 1992). These studies have adopted a "strategic issues processing" perspective rather than the "upper echelons" perspective in that the team is defined by who participates in strategic decision-making rather than by members' positions (Jackson, 1992).

One study of TMTs from single-business technology-based companies was concerned with ensuring that TMTs were "real teams" and represented the firm's dominant coalition. The researchers interviewed CEOs and asked them to identify their firm's TMT members. They found that 78% of the team members who were identified were also officers of the corporation (Smith et al., 1994). If this study can be generalized to other industries, it suggests that considerable overlap exists between TMTs identified directly by CEOs and those based solely on organizational position. This study does not address the degree of interdependence or whether the TMT members have shared goals.

Domain of Studies in the Sample

Table 4 lists the 13 empirical studies of management teams concerned with effectiveness outcomes conducted in the last six years. Eight of the thirteen studies are in manufacturing industries, two are in service industries, and three are in a mixture of industries. New venture TMTs are the focus of two studies, with the remainder examining established teams. In contrast to studies of the other types of teams, all the studies except for Korsgaard et al. (1995) look at TMTs across multiple companies. This follows from the nature of TMTs; there is only one per firm.

Insert Table 4 About Here

In contrast to the studies of the other types of teams, all of the TMT studies collected data on group composition. No study collected data on the TMT task. Few studies examined group processes, and when they did their focus was internal to the team rather than external, even though contacts with external constituencies such as key customers, financial analysts, and Board of

Directors are critical for TMTs. Studies also did not consider external communication between TMT members and subordinates or other firm members. Some studies considered environmental factors, but very few considered organizational context factors, except firm size as a control variable. Two studies examined group psychosocial traits as independent variables.

The research methods used seem to determine the choice of variables that are studied. Because the majority of studies rely on archival data, the variables studied are often limited to the information that can be obtained through archival sources. For example, team demographics and industry effects are often studied. Missing is the information that can only be obtained through field studies of TMTs, even if the information is important for understanding how TMTs function. For example, the uncertain and complex TMT task is likely to have an impact on how TMTs operate and on their effectiveness. Yet, in contrast to the studies of work teams and even project teams, task features are not studied. Field studies are needed that examine, for example, the strategic issues being discussed, the amount of interdependence on the team, the relationship between TMTs and other decision-making bodies, and decision-making roles and processes.

On the other hand, archival data are used to create interesting objective measures of TMT phenomena. For example, Finkelstein (1992) studied power in TMTs and created measures of structural power based on formal titles and compensation, ownership power based on shares of stock and familial relationships to the founder or other officers, expert power based on the match between key environmental requirements and functional expertise, and prestige power based on membership in boards and educational background. His study demonstrated the validity and reliability of these measures. CEO dominance has been measured by using a coefficient of variation for the objective measures of power, and assessing when power is unevenly distributed and concentrated in the CEO (Halablien & Finkelstein, 1993; Hambrick & D'Aveni, 1992). These objective measures provide a valid way for collecting data about sensitive subjects and complement what can be learned through the use of perceptual measures.

Definition and Measurement of Effectiveness

The vast majority of TMT studies define effectiveness as firm performance. Objective measures are used, the most common being return on equity (for example, Finkelstein & Hambrick, 1992), return on assets (Michel & Hambrick, 1992), sales growth (Eisenhardt & Schoonhoven, 1990), and total return to shareholders (Halablien & Finkelstein, 1993). Several studies use more than one measure of firm performance (Finkelstein & Hambrick, 1992; Halablien & Finkelstein,

1993; Isabella & Waddock, 1994). Although firm performance is influenced by many factors not directly related to the TMT, it certainly can be argued that the ultimate measure of TMT performance is firm performance. A key strength of TMT studies is their use of objective measures of organizational performance.

Two studies assess decision quality as the measure of management team effectiveness (Amason, 1996; Korsgaard et al, 1995). Decision quality is a group-level rather than an organizational-level indicator of effectiveness. In contrast to other types of teams, TMT studies usually do not assess group-level outputs.

A few studies focus on behavioral outcomes. Turnover from both the team and the firm is studied the most (Hambrick & D'Aveni, 1992; Jackson et. al, 1991; and Weirsema & Bird, 1993), but promotions were also assessed (Jackson et al., 1991). Some studies measure firm-level behaviors as their dependent variables such as strategic re-orientation or change (Lant et al., 1992; Weirsema & Bantel, 1992), acquisition activities (Finkelstein, 1992; Weirsema & Bantel, 1992), and strategic persistence (Finkelstein & Hambrick, 1990). These firm-level behaviors, however, are not measures of effectiveness. For example, both strategic persistence and strategic re-orientation can contribute to performance effectiveness, depending upon environmental conditions.

Key Findings

Key findings for management teams are found in the areas of group composition, organizational context, environmental factors, internal processes, and group psychosocial traits.

Group Composition

Management team studies examined demographic variables, the variation in those variables (diversity), and the size of the team as factors influencing performance and behavioral outcomes. The interest in demography has both psychological and sociological roots: Schneider (1983) argued that through the processes of attraction, selection, and attrition, organizations evolve toward a state of interpersonal homogeneity and dissimilar members may be encouraged to leave. Pffeffer (1983) asserted that the demographic characteristics of organizations shape behavior patterns (such as communication, job transfers, and turnover) and ultimately performance. The studies conducted by Jackson et al. (1991) and Smith et al. (1994) stand out because they integrate psychological and sociological theory.

Team tenure. Tenure on a management team is expected to have a positive impact on firm performance because executives who work together closely for a period of time should coordinate

and make decisions more effectively. However, the empirical results are mixed. In a study of new ventures in the semiconductor industry, Eisenhardt and Schoonhoven (1990) found that higher levels of prior joint work experience among members in the founding team were associated with greater sales growth. In contrast, Smith et al. (1994) found that team tenure was not related to either sales growth or return on investment in established high technology firms. In a study of TMTs in the food processing and furniture manufacturing industry, TMT tenure was not related to decision quality (Amason, 1996). Perhaps, prior joint experience is critical for performance at the beginning of a firm's life, but the impact of tenure fades once a baseline of experience is established.

Team tenure diversity. In a study of TMTs in Japan, Weirsema and Bird (1993) found that heterogeneity of team tenures was associated with turnovers in a model that controlled for normal retirements associated with age. They argue that the greater homogeneity in Japanese society and organizations lead to more attention being paid to even slight differences, and the impact of differences in tenure will greater in Japan than it would be in the U.S. This was the only study that looked at the impact of demographic variables in non-U.S. settings and the only study that examined diversity in team tenures.

*Organizational tenure***.** Contradictory arguments are made about the impact of organizational tenure on performance. Management teams comprised of executives with longer tenures should formulate more effective strategies for improving company performance, because experience should result in deeper understandings of their companies and competitive environments (Schwenk, 1993). Similar to team tenure, longer organizational tenure also may indicate social cohesion, which can expedite effective performance (Hambrick & D'Aveni, 1992). On the other hand, longer organizational tenure may lead to rigidity and complacency (ibid). Long-tenured executives may become committed to outdated assumptions and strategies, develop a biased view of past performance and less effective strategy formulation in the future, and consequently cause poor performance (Schwenk, 1993).

Schwenk (1993) did not find any direct relationship between organizational tenure for TMTs and return on equity or sales growth. Based on a content analysis of annual reports, however, he did find that longer tenured executives developed biased attributions (taking credit for positive outcomes and laying blame on the environment for negative outcomes), and the biased attributions for negative events was associated with poorer return on equity, slower growth in

return on equity, and lower sales growth. In a study that compared a matched sample of firms that went bankrupt with those that succeeded, Hambrick & D'Aveni (1992) found that the firms that went bankrupt had significantly shorter firm tenures for each of the four years prior to bankruptcy, reflecting the high turnover that occurs in troubled firms. It is difficult to explain how organizational tenure influences performance from these studies.

Studies of strategic persistence and change provide clarification. Finkelstein and Hambrick (1990) found strong support for a relationship between long organizational tenures and strategic persistence and conformity to industry performance norms. Weirsema and Bantel (1992) found that short organizational tenures were positively related to strategic change in diversification strategies. Bantel (1994) found that short organizational tenures were positively related to strategic planning openness. These studies provide support for the argument that longer organizational tenure leads to commitment to the status quo, reduced information processing, risk aversion, and rigidity. For organizations that need to make strategic shifts to respond to competitive demands, TMTs comprised of long-tenured executives are likely to be less effective.

Organizational tenure was not related to TMT turnover in U.S. (Jackson et al., 1991) or Japanese firms (Weirsema & Bird, 1993). It is interesting that the longevity of organizational experience for TMT members is related to firm behaviors, but not to the personal behavior of leaving a firm.

*Organizational tenure diversity***.** Smith et al. (1994) found that TMTs with greater heterogeneity of experience had lower return on investments. However, heterogeneity of experience was not related to sales growth. The amount of diversity in organizational tenures for TMTs did not differentiate the bankrupt from the surviving firms (Hambrick & D'Aveni, 1992). Diversity in organizational tenures for TMTs was not significantly related to turnover in U.S. firms or in Japanese firms (Jackson et al., 1991; Wiersema & Bird, 1993). It also was not related to strategic re-orientation (Wiersema & Bantel, 1992). It is difficult to interpret these findings. Perhaps, it is the level of experience rather than dissimilarity in experience levels that influence TMT behavior and results.

Age. Not surprisingly, age was expected to be positively associated with turnover in management teams, because top level executives are likely to be near retirement age. At the individual level of analysis, Jackson et al. (1991) found age to be related to turnover for the sample as a whole, and for subgroups composed of the highest level management team members

and the next level down. At the group level of analysis, Jackson et al. (1991) found turnover rate not to be related to average age for the sample as a whole and the subgroup composed of the lower status members, but positively related to turnover for the higher status subgroups. The higher status subgroups were older and closer to retirement age than the lower status subgroup. Contrary to their hypothesis, Weirsema and Bird (1993) found age to be negatively related to turnover of TMT members in Japanese firms, that is, higher team mean age was associated with lower turnover for all turnovers that occurred irrespective of age, and for turnovers that occurred under age 65. This finding held both at the individual and group-level. They suggest that the incidence of turnover may be greater for younger Japanese executives because they have more opportunities outside the firm.

*Age diversity***.** Both Jackson et al. (1991) and Wiersema and Bird (1993) found heterogeneity of age on the TMT to be positively related to turnover. It was not related to strategic change (Weirsema and Bantel, 1993). No studies tried to relate heterogeneity of age to performance outcomes.

Functional background. The functional background of management team members represents the expertise available to the management team. One view is that the adequate representation of core functional areas — marketing, operations, and R &D — is of critical importance to the firm's health (Hayes & Abernathy, 1980). Hambrick & D'Aveni (1992) found that the percentage of the team with core function expertise was lower for firms going bankrupt beginning three years prior to the bankruptcy.

*Functional background diversity***.** Halablien and Finkelstein (1993) found that functional heterogeneity was negatively related to performance. This relationship was marginally significant for companies in the computer industry, but not significant in the natural gas industry. This relationship was consistent with the general pattern that they found, which was that TMT composition did not have significant effects in the natural gas industry. The authors argue that there is far less environmental turbulence and fewer choices for top managers to make in the natural gas industry, constraining the impact of management team characteristics on performance. Smith et al. (1994) hypothesized that functional heterogeneity would be negatively related to performance because of added coordination and control costs. Contrary to their hypothesis, they found that functional heterogeneity was not related to performance in high technology companies. It is surprising that Smith et al. (1994) and Halablien and Finkelstein (1993) results are different,

because they both studied high technology companies embedded in a turbulent and uncertain environmental context. Smith et al. (1994) found no relationship between functional diversity and team interaction processes. Interestingly, Ancona and Caldwell (1992b) also found no relationship between functional diversity and internal team processes in project teams.

The results from the studies of strategic planning openness and strategic re-orientation are more consistent. In her study of strategic planning openness in retail banks, Bantel (1994) found functional heterogeneity to be positively associated with strategic planning openness, although marginally statistically significant. Lant et al. (1992) found functional heterogeneity in both the furniture and software industry to be positively associated with strategic re-orientation. Bantel (1994) and Lant et al. (1992) both make cognitive arguments saying that functional diversity will influence strategy formulation through its effect on the diversity of perspectives applied to strategic questions, resulting in a greater search for information, more extensive discussion of options to resolve disagreements, and the generation of more novel ideas. Additional research is needed to clarify the impact on performance of functional diversity.

Education diversity. Jackson et al. (1991) found that heterogeneity in whether TMT members had an undergraduate or graduate degree in business administration was associated with turnover, at a marginal level of statistical significance. They found that the degree that an executive was different from other TMT members in his level of education and whether or not he had a business degree predicted whether or not he would leave the firm. Wiersema and Bird (1993) found that differences in the prestige of the university attended by Japanese TMT members predicted top team turnover. It makes sense that heterogeneity in educational background is likely to be associated with TMT turnover, because dissimilarity may create discomfort and those that are dissimilar may be encouraged to leave (Schneider, 1983). On the other hand, dissimilarity in educational backgrounds may have both positive and negative impacts on TMT deliberations and firm performance. Similar to functional diversity, educational specialization diversity may enable a broader range of perspectives to be applied to strategic problem-solving, but this diversity may also result in increased coordination and control costs.

Size of team. Four studies considered team size to be a predictor variable. Hambrick and D'Aveni (1992) found that firms nearing bankruptcy tended to have smaller sized teams than matched-pair survivors, and that this difference was significant in the year prior to bankruptcy. Eisenhardt and Schoonhoven (1990) found that greater founding team size was associated with

sales growth in new semiconductor firms. The rationale for this finding is that at a fundamental level, the resources for a team come from the number of people on it, and particularly for new firms, having more founders means that there are more people available to do the huge job of beginning a new enterprise. On the other hand, the greater the number of members, the higher the coordination and control costs. Informal methods for coordination are unlikely to be effective, and formal, bureaucratic procedures may need to be followed. Because the use of formal bureaucratic procedures would slow down decision-making, Smith et al. (1994) hypothesized that team size would be negatively related to performance in high-technology companies, high-velocity environments that demand quick decision-making. They found that team size was not directly associated with performance. However, team size was negatively related to informal communication, and informal communication was negatively related to sales growth. In other words, larger teams were more likely to communicate formally, which was positively related to sales growth.

Halablian and Finkelstein (1993) considered both arguments about team size and hypothesized that the team size that is appropriate may depend upon a firm's environment. They hypothesized that the more turbulent the environment, the greater the information processing requirements, and the greater the need for larger teams to cope with environmental unpredictability. In stable environments, much of the work is routine, and the coordination costs from large size teams would be greater than the benefits associated with the availability of additional talent. They found that team size was more positively related to performance in the computer industry than in the natural gas industry, supporting their hypothesis.

Summary: Demographic variables and demographic diversity effects. In general, the impact of TMT demographic variables and demographic diversity on outcomes were mixed. The most consistent findings occurred when tenure predicted strategic persistence and change, and when demographic heterogeneity predicted turnover. The least consistent findings occurred when either demographic variables or demographic diversity predicted firm performance. We believe that outcomes are influenced by demography when there is a direct relationship between the outcome and the demographic variable being assessed. There is a direct relationship between tenure and strategic persistence, in that executives who have been in the firm longer will be more committed to the strategies they have formulated and implemented. Similarly, there's a direct relationship between diversity and turnover, in that similarities attract and those dissimilar may be

pressured to leave the team (Schneider, 1983). In contrast, it is hard to make an argument for a direct relationship between demographic variables or demographic diversity and return on equity or sales growth.

Organizational Context

Leader Behaviors. In an experiment with intact management teams from a Fortune 500 high technology company participating in an executive program on strategic management, Korsgaard et al. (1995) examined the impact of leader behaviors on perceptions of fairness, decision commitment, trust in the leader, and decision quality. Intact management teams were asked to analyze a case and make strategic recommendations. Leaders that showed high consideration actively listened to members inputs; leaders that showed low consideration listened without comment. Members in high consideration groups had higher perceptions of fairness and higher commitment to the recommendations that were reached. Member attachment and trust in the leader increased under high consideration and decreased under low consideration. As anticipated, leader consideration did not have a significant effect on decision quality.

Team leaders changed their initial recommendation to incorporate members' input in the high influence condition, and they maintained their original position in the low influence condition. Team members in the high influence condition had perceptions of higher levels of fairness and decision commitment. Their trust of the team leader grew over time. Judges rated the decision quality of the recommendations the highest for those in the high influence condition.

Even though the members of these groups had a past history of working together, leaders who actively listened to team members and incorporated their ideas into a final recommendation significantly affected members' attachment to the team, their trust in the leader, and the quality of decisions made in this training session. This has considerable ramifications for the impact of leader behavior in an ongoing work context.

Environmental Factors

Industry effects. Industries vary in their degree of environmental turbulence and the discretion they provide to top managers. The environments for computer, chemical, and natural gas firms vary in their degree of turbulence, with computer firms embedded in the most turbulent environments, natural gas the least, and chemical firms somewhat in-between. Top managers have more discretion in high turbulent environments (Finkelstein & Hambrick, 1990; Halablian & Finkelstein, 1993). These authors used industry as a proxy measure for environmental turbulence

and managerial discretion. As already discussed, they found that industry moderated the effects of demography on performance, with the strongest results occurring in computer firms.

Market effects. Eisenhardt and Schoonhoven (1990) categorized markets as emergent, growth, or mature for each year in their study of new semiconductor ventures. They also measured competitive concentration as the ratio of sales of the four largest competitors in the market to the total sales in the market. They found that growth stage market (but not competitive concentration) was positively associated with sales growth. They also found that the stage of the market interacted with the demographic effects discussed earlier, in that the firms with the strongest management teams in growth markets had the highest rates of sales growth.

Internal Processes

Smith et al. (1994) tested three alternative models of the effects of the TMTs demography and process on performance. This study makes an important contribution in that it does not presume group process from demographic variables, but instead tests whether group processes contribute to performance outcomes above and beyond team demography. It also tests an intervening model in which the effects of the TMT demography influence group process which in turn influences performance outcomes. We have already presented the specific demography findings, in which demography does predict variance in ROI but not in sales growth. Group processes predict variance in both ROI and sales growth. Finally, the intervening model was not supported because demography had direct performance effects.

Social integration. The level of social integration was positively related to ROI and to sales growth (Smith et al., 1994). Social integration is a measure of team cooperation and cohesiveness. This finding is intriguing because it suggests that TMTs that are well-integrated perform better than teams that are not. This result is supported by an interview study of CEOs by Hambrick (1995) in which he asked them to identify obstacles to TMT effectiveness. The key obstacle that CEOs identified was the fragmentation of the top team. Katzenbach & Smith (1993) also identified fragmentation and the lack of "teamness" as an obstacle to management team effectiveness.

Communication. Communication frequency was negatively related to both ROI and sales growth, contrary to what had been hypothesized. Smith et al. (1994) suggest that perhaps communication frequency is indicative of high levels of conflict in the group, and that the time spent on group maintenance detracts from performance. No other studies of TMTs looked at communication frequency. Informal communication was negatively related to sales growth,

contrary to the authors' expectations (ibid). They suggested that there may be a threshold level of formal communication that may be needed even in socially integrated teams to achieve high sales growth.

Conflict. Amason (1996) compared the impact of cognitive conflict (task-based) and affective conflict (relationship-based) on strategic decision quality, understanding, commitment, and affective acceptance for TMTs in the food processing and furniture industries. He predicted that TMTs with higher levels of cognitive conflict will produce higher-quality decisions, have higher levels of understanding, be more committed, and have greater affective acceptance. TMTs with higher levels of affective conflict will produce lower-quality decisions, have lower levels of understanding, be less committed, and have less affective acceptance. He tested his hypotheses in the full sample and split samples, in which the predictive variables were taken from one half and the dependent variables from the other half of each team. In the full sample, he found that cognitive conflict was positively related to decision understanding and affective acceptance, but was not significantly related to decision quality and decision commitment. In the split sample, cognitive conflict was positively related to decision quality and affective acceptance. In the full and split samples, affective conflict was negatively related to decision quality and affective acceptance, but not related to decision understanding and decision commitment. When relationships were significant, the effects of cognitive conflict were positive and the effects of affective conflict were negative. Jehn (1995) also found cognitive conflict to be beneficial and affective conflict dysfunctional in her study of work and management teams.

Psychosocial Traits

Certainty. Isabella and Waddock (1994) explored the concept of TMT certainty and its relationship to firm performance in a banking simulation. Certainty is a cognitive concept that describes the degree of confidence that the TMT has about its assessment of the competitive environment and its strategic decisions. They found a significant positive relationship between TMT certainty and performance. The team's beliefs about the environment and a strong team orientation were key determinants of certainty, while actual environmental turbulence and the consensus within the TMT were not. This study points to the critical role of the shared beliefs of TMT members. Perceptions can have stronger effects than objective reality in determining performance.

Attribution biases. As discussed earlier, Schwenk (1993) found that negative attribution biases (blaming forces outside one's control for negative events) was associated with poorer performance. Evidence for these shared cognitive biases were found by analyzing the attributions for positive and negative events in the company's annual report. Lant et al. (1992) analyzed the attribution biases in 10K reports and the president's letter in annual reports of furniture and software companies. They found that negative attribution biases were negatively associated with strategic re-orientation in software companies but not in furniture companies. They make a cognitive argument in that TMTs will perceive little need to change their strategies if they interpret external forces to be the cause of poor performance.

Conclusion

To conclude, we first compare the types of teams in terms of the categories of variables that were studied (for example, task design and internal processes) and the settings in which the studies took place. Next, we discuss the progress that has been made and what still needs to be done for studying groups in organizations. We then summarize seven key learnings from the studies in the past six years. Finally, we highlight areas for future research.

Comparison Among Types of Teams

The studies of different types of teams emphasized different categories of predictor variables and effectiveness outcomes. Table 5 presents the comparison of what was studied for the different types of teams (work, parallel, project, and management). This comparison uses our heuristic framework as an organizing device breaking down the variables studied into the seven categories: task design, group composition design, organizational context design, environmental factors, internal group processes, external group processes, and group psychosocial traits. An effectiveness category highlights the different outcomes that were investigated for each type of team.

Table 5 illustrates that studies of different types of teams varied in their choice of predictor variables. For example, several studies of work teams, parallel teams, and project teams, but no studies of management teams, looked at the impact of task design on effectiveness. The vast majority of top management team studies, but almost no project team studies, looked at the impact of group composition variables on effectiveness. Project team studies, in contrast to studies of other types of teams, examined how external processes influence effectiveness. Management team studies and one work team study considered environmental factors as predictors.

Insert Table 5 About Here

The studies of different types of teams also differed in how they measured effectiveness. About half of the work and parallel team studies, and almost all of management teams studies, employed objective measures for performance effectiveness, but none of the project team studies did. Effectiveness was usually measured at the group-level for work, parallel, and project teams, and at the organizational-level for management teams. Most studies had multiple measures of effectiveness.

In total, there were 24 studies of work teams (including 7 of self-directed work teams), 4 studies of parallel teams, 13 studies of project teams, and 13 studies of management teams that fit our domain. Out of these studies, 29 were conducted in manufacturing organizations, 14 in service, 5 in government, and 6 in a mixture of settings. The work and parallel team studies were evenly divided between manufacturing and service sites, while project and management team studies took place primarily in manufacturing settings. Most project team studies were of new product development efforts in high-technology companies.

Considerable Progress Has Been Made

A decade ago, McGrath (1986) identified ten critical needs in the study of groups at work. Against his list, the studies of the past six years match up rather well. McGrath stated that groups should be studied in context. In this review of empirical field studies, we see over 50 studies that do just that. The overwhelming majority of these studies employ a group level of analysis rather than an individual or organizational one; this, too, McGrath suggested. The sample size is large; approximately half of these studies have sample sizes of 50 groups or more and eight had 100 groups or more. We have attempted to develop a categorization scheme of how groups vary in type, another item on McGrath's list of needs. Thus, we classify groups according to work teams, parallel teams, project teams, and management teams. The groups in the studies we review fall into these categories, allowing us to clarify the factors that predict effectiveness for different types of groups.

McGrath further asked that studies of groups at work expand their data collection tools beyond self-reports of managers and team members. More studies balance data collection methods and

use multiple measures than ever before, but data collection strategies vary for different types of teams. Nearly half of the work and parallel team studies we reviewed collected objective measures of performance in addition to perceptual assessments. These studies also measured attributes of effectiveness beyond task performance, including numerous attitudinal and behavioral measures. Almost all of the management studies collected objective measures of firm performance, but did not collect group-level effectiveness measures and rarely collected behavioral or attitudinal measures. To understand management teams as performing units, data collection needs to occur at the group level. Project teams lag behind the other types of teams in the use of objective measures. Nearly every project team study in this sample collected only subjective measures of performance as assessed by managers and team members. Project team outputs typically are viewed as existing too far in the future for easy objective assessment (Sundstrom et al., 1990), but they may be easier to assess than suspected. Many high-technology products have a very short product lifecycle time, with sales in the first six months often representing the bulk of sales for the product. Thus, market share, ratings by trade publications of the product, performance to customer expectations, and development cycle time might all serve as objective measures of a team's performance. Additionally, attitudinal and behavioral outcomes can and should be captured.

Requirements for Future Research

Although considerable headway has been made in the study of teams at work, there are things we still need to do. We argue throughout the paper for more complete descriptions of the technology, task, and products associated with teams. This is true for all types of teams: for example, we need to understand the equipment that a work team uses, the scope of a quality circle effort, the risk associated with a product that a project team develops, and the strategic issues that a management team confronts. Furthermore, we need to understand the organization and industry in which teams are embedded – the mission, structure, competitive challenges, and so forth. This information provides the context to interpret study results.

We need to shape our research methods and measures to the phenomena we are studying rather than limiting what we choose to study based on expedience and comfort. For example, much more field work is needed to study top management and business unit management teams. The extent to which management teams are "real teams" (and not only a collection of corporate officers) and the degree to which "teamness" matters for performance, can only be studied in the field. Progress on

understanding the internal and external processes that influence management team performance will only occur when measures other than archival ones are used. Part of the reason that demography and diversity have been studied so extensively in management teams is the preference of strategy researchers for archival measures. Similarly, project team researchers need to complement their use of survey performance measures with non-reactive archival measures (such as trade publication ratings of products as discussed above). In addition, more longitudinal studies need to be done. They are difficult to do and time-consuming, but often the best way to assess causality.

We also need to select variables to be studied not because they have been traditionally studied, but because they help us to understand the effectiveness of different types of teams. For example, aspects of the task other than autonomy, interdependence, or Hackman and Oldham's (1975) five job characteristics may influence performance. The breakdown and allocation of work, the use of integrating mechanisms, and the pace of technological change are likely to shape project team deliberations and effectiveness. Different sets of variables have been studied for each type of team reflecting past research as much as the nature of each type of team (see Table 5). For example, demographics and diversity have been understudied in project teams even though their membership often comes from multiple functions. External processes have not been studied in TMTs, even though external contacts with customers, financial analysts, board members, and others may impact performance. The preference for certain types of measures has led to the use of proxy variables — for example, using organizational tenure as a proxy measure of social cohesion. We do not recommend the non-validated use of proxy variables, because the inferences that are drawn may be incorrect; for example, if long tenure positively predicts firm performance, it doesn't necessarily mean that social cohesion predicts firm performance. The use of multiple measures and methods helps to compensate for weaknesses in any singular approach.

One way to translate this principle into practice is through interdisciplinary research. Research teams comprised of academics from different disciplines are likely to draw upon multiple theories and use multiple methods in their research approaches. For example, the studies of TMTs conducted by Smith et al. (1994) and Jackson et al. (1991) benefited from combining psychological and sociological perspectives. This review was written by an organizational behaviorist and an industrial engineer, and we believe that the differences in our disciplinary

backgrounds helped us to cover a wide domain of studies and to combine integrative and analytic logics in our interpretation of them.

Finally, studying groups in context means taking seriously the notion of systemic levels in organizations. Groups are embedded in larger social systems that influence how they behave and perform. Performance at one level may not be related and may even conflict with performance at another level. For example, a project team may be successful in terms of its goals, but not contribute to the business unit's success, because it wastes resources or hurts other efforts with which it is interdependent. Conversely, business unit managers may make decisions that contribute to the business unit's effectiveness but diminish a project team's effectiveness, for example, by removing key personnel from one project and placing them on another more important project. Few studies that we reviewed compared performance at multiple levels. Instead discussions about level of analysis were primarily concerned with using the appropriate statistical methods for justifying aggregation. Future research needs to examine group behavior and performance at multiple levels and generate theory to explain the conflicts that are bound to occur.

What Have We Learned about Team Effectiveness

Progress has been made not only in methods but in substantive knowledge about team effectiveness in the last six years. We present seven key learnings from this set of studies:

1. The type of team matters for the determinants of effectiveness. By distinguishing among types of teams, this review clearly indicates that the variables that are studied and the findings that are captured vary for different types of teams. For example, studies of project teams examine external processes and have found that they matter for performance effectiveness. Studies of work teams have not considered external processes, so we do not know whether they contribute to performance effectiveness. Perhaps external processes are less important for work team as compared to project team performance, given the difference between their composition and tasks. We began this review with a heuristic model of team effectiveness, but perhaps there should be different models of effectiveness for different types of teams. Although the articulation of different models goes beyond the scope of this review, this is clearly an area for future work.
2. The performance and attitudinal benefits from self-directed work teams are superior to those from parallel teams. Several studies and meta-analysis found performance and attitudinal benefits from self-directed work teams and not from parallel teams. This finding matches

earlier studies of self-managing work teams (see Goodman, Devadas, & Griffith-Hughson, 1988) and quality circles (Ledford et al., 1988). Therefore, substantive participation is a superior predictor of outcomes than consultative participation.

3. Group cohesiveness is positively related to performance. Three meta-analyses and several empirical studies found a slight to moderate positive relationship between cohesiveness and performance. This is a robust finding in an area that has long been studied.
4. Autonomy is associated with higher performance for work teams, but not for project teams. Although some theorists have argued for the self-management of project teams, it does not fit the empirical evidence. We can only speculate about the reasons for this finding. For example, the professionals who typically belong to project teams enjoy discretion in other aspects of their work, and may view the leaders' activities in assigning work, coordinating activities, clarifying procedures, and communicating to higher level managers as enabling greater efficiency and technical innovation. Additional research should clarify the role of autonomy and participation for project team success.
5. The factors most associated with success vary based on who is rating the team's performance. Team members tend to rate the team's performance high if the team has engaged in healthy internal processes such as collaboration and resolution of conflict. Managers, who may be less intimate with the group's internal dynamics, rate a team highly according to more external factors, like the amount of communication the group has with external agents. The differing assessments do not imply that subjective measurements should be replaced by objective ones. Objective measures should be sought if what we are interested in is how well the group is achieving quantitative goals. But in many instances, what we are interested in are perceptions of effectiveness from key stakeholders.
6. Diversity in demographic variables is related to performance outcomes in complex ways. For example, functional diversity was found to have no significant effect on performance in work teams, a positive effect in parallel teams, and a mixed effect for project teams (a direct negative effect, but an indirect positive one), and a mixed effect for management teams (a negative impact in one study and no impact in another study). Surprisingly, functional diversity was not related to internal team processes in a study of project teams (Ancona & Caldwell, 1992b) and a study of TMTs (Smith et al., 1995). Although several theoretical pieces have been written about the impact of different types of diversity on communication, decision-

making dynamics, and conflict (Maznevski, 1994; Jackson, May, & Whitney, 1995; and Pelled, 1995), careful empirical field work is needed. Additional research needs to test theory that relates demographic diversity to group processes, and the processes to outcomes.

7. Cognitive and affective dimensions of key constructs are likely to have different impacts on outcomes. For example, Jehn (1995) in work and management teams and Amason (1996) in TMTs showed that cognitive conflict (task-based) had a beneficial impact while affective conflict (relationship-based) did not. Supervision and leadership were examined separately in terms of affect (George & Bettenhausen, 1990) and cognition (Eden, 1990; McDonough & Barczak, 1992), with interesting results for both. Mullen et al. (1993) showed that the more affective the operationalization of cohesiveness, the more cohesiveness impaired decision quality. Future researchers should examine their constructs carefully to see if affective and cognitive components might exist separately, then theorize and test for differing relationships and effects.

Areas for Future Research

1. *Group Cognition and Affect.* Researchers are claiming that traits which we usually conceive of at the individual level can also be viewed at the group level. Only a few studies have looked at group cognition, and they have found evidence of a collective mind in flight carrier crews (Weick & Roberts, 1993), and transactive memory (Wegner, 1986; and Liang et al., 1995) influencing performance effectiveness. Laboratory experiments have found that group moods influence cognitive processing and decision-making. It was in this vein that George (1990) investigated the possibility of a group affective tone. Her results, discussed earlier, indicate that groups can display collective affect, and that this collective affect can have an influence over group effectiveness. Additional theoretical work is still needed, however, to clarify the meaning of concepts such as group affective tone. How is it different from similar concepts, such as group cohesiveness, that have been studied for decades? In general, more empirical field studies are needed to probe more deeply the idea of cognition and affect, their relationship to one another, and their impact on effectiveness.
2. *Group Potency and Collective Self-Efficacy*. Collective self-efficacy and group potency are related but separate terms (Guzzo et al., 1993; Lindsley, Brass, & Thomas, 1995). Both terms

refer to beliefs on the part of group members regarding the group's ability to be successful, and as such are group-level analogs to Bandura's (1982) concept of self-efficacy. While these terms appear in team models and theories as positive antecedents of effectiveness (for example, Shea & Guzzo, 1987; Cohen, 1994; Lindsley, Brass, & Thomas, 1995), little empirical field work exists to document this relationship. More research on the antecedents and consequences of both variables is desired.

3. *Virtual and Global Teams.* Physical proximity enhances information processing (Allen, 1977; Katz, 1982), which is positively related to managers' evaluations of project quality (Keller, 1994). Pinto, Pinto, and Prescott (1993) found that physical proximity was positively associated with internal cooperation, which in turn was positively associated with team member ratings of efficiency. Virtual teams, whose members do not all reside in the same physical location, lack physical proximity. Yet their use is expected to increase with the growing internalization of firms (Adler, 1991), with many teams comprised of employees from multiple countries. What, if any, substitutes exist for co-location? How effective are group decision support software (GDSS) systems and video-conferencing for project teams? What role will existing and emerging advanced communication technologies, like chat rooms and video phone calls on the Internet, play in communicating team information? What impact do cultural differences have on team processes and performance?
4. *Environmental (Institutional) Factors*. Given the current fascination with teams and their association with competitiveness in the popular press, it seems very likely that a firm's decisions regarding team job design characteristics might be heavily influenced by its institutional environment. For example, if a firm's competitors all employ self-directed teams and its customers come to believe that quality is achieved through such teams, then that firm may perceive little choice but to implement a self-directed work team program of its own. In this situation, we might expect that proper organizational support and resources might be lacking at the firm if the program is more show than substance. The result would be lower team performance. Similarly, if an industry experiences a lot of turnover at the managerial level, then we might see a rapid diffusion of team practices among firms as managers bring with them ideas from their former workplace. Employees at a manager's new firm may balk at what they consider to be imported rather than home-grown team programs; their recalcitrance might lead to poor team performance. Customer expectations and the diffusion of practices are

just a few of the environmental factors that may serve as design variable antecedents. Such antecedents are currently largely missing in the heuristic framework of Figure 1, yet may play a critical part in explaining a group's performance.

5. *Time.* McGrath (1986) noted that researchers profess to study group dynamics but in reality study group statics. Worchel (1994) agrees, noting that most present research on group behavior still resembles snapshots, with few longitudinal studies undertaken. He argues that group change and development are the causal agents for many social and cognitive activities within the group context. The bulk of the existing work on time and temporal patterns in groups is either theory (for example, Worchel, 1994; McGrath, 1991) or laboratory experiments (for example, McGrath, Kelly, & Machatka, 1984; Kelly, Futoran, & McGrath, 1990). Gersick's (1988) empirical field study of group developmental processes has unfortunately not been followed by other in-context investigations, but needs to be so. One particularly interesting finding from the existing studies is the lasting effect of early events or decisions taken by the group on their actions for a long period afterwards. Future field studies might examine the conditions that promote effective decisions in the group's initial stages.

The last six years has advanced our knowledge of teams in organizations. But to paraphrase Bettenhausen (1991), the best is yet to come. We look forward to continuing our journey through the group terrain: from the shop floor, through the research and development lab, and to the executive suite.

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Table 1. Summary of Work Team Studies

			Types of Variables Studied							Types of Outcomes Measured			
			Design			Processes		Environ.	Psycho-	Performance		Behavioral	Attitudinal
Authors	# Teams	Team Description	Task	Group Comp.	Org'l Context	Internal	External	Factors	Social Traits	Objective	Perceptions		
General Work Teams													
Brewer, Wilson, & Beck (1994)	20	police teams			x						x		
Campion, Medsker, & Higgs (1993)	80	financial service clerical groups	x	x	x	x	x		x	x	x		x
Eden (1990)	29	military groups			x					x			
Ganster & Dwyer (1995)	215	white- & blue-collar groups type of firm(s) not specified	x	x							x		x
George (1995)	53	retail sales groups			x				x		x		x
George (1990)	26	retail sales groups	x	x					x			x	
George & Bettenhausen (1990)	33	retail sales groups			x				x	x		x	
Goodman & Leyden (1991)	26	mining crews		x	x					x			
Gupta, Dirsmith, & Fogarty (1994)	96	government audit teams	x	x	x			x			x		
Jehn (1995)	79	transportation company groups	x	x		x			x	x	x	x	x
Martz, Vogel, & Nunamaker (1992)	5	computer manufacturing groups	x	x	x				x		x		
Vinokur-Kaplan (1995)	15	psychiatric treatment teams	x	x	x	x			x		x		x
Wageman (1995)	150	equipment maintenance groups	x		x				x	x	x		x
Wang (1994)	*	chain factory shop-floor employees							x	x	x		x
Yammarino & Dubinsky (1990)	57	retail & insurance sales groups	x		x						x		x
Zigurs & Kozar (1994)	10	computer company groups	x		x						x		
Zimmermann (1994)	*	hospice health care teams	x			x			x		x	x	x
Self-Directed Work Teams (SDWTS)													
Batt & Appelbaum (1995)	*	telecommunications and apparel groups	x	x	x						x		x
Cohen & Ledford (1994)	100	telephone company clerical & administrative groups	x								x	x	x
Cohen, Ledford, & Spreitzer (1996)	138	telephone company clerical & administrative groups	x	x	x	x			x		x	x	x
Cordery, Mueller, & Smith (1991)	*	mineral processing groups	x									x	x
Pearson (1992)	28	engineering workshop groups	x							x		x	x
Seers, Petty, & Cashman (1995)	*	manufacturing groups	x			x			x	x	x	x	x
Weisman et al. (1993)	*	hospital nursing units	x			x					x	x	x

* level of analysis was not the group x - indicates that the study examined at least one variable under this category

Table 2. Summary of Parallel Team Studies

			Types of Variables Studied							Types of Outcomes Measured			
			Design			Processes		Environ.	Psycho-	Performance		Behavioral	Attitudinal
Authors	# Teams	Team Description	Task	Group Comp.	Org'l Context	Internal	External	Factors	Social Traits	Objective	Perceptions		
Parallel Teams													
Adam (1991)	7	electro-mechanical manufacturing quality circles & control groups	x	x	x	x			x	x	x		x
Magjuka & Baldwin (1991)	72	computer manufacturing employee involvement teams		x	x						x		
May & Schwoerer (1994)	*	employee involvement teams in a meat-packing plant			x	x			x	x	x	x	x
Steel, Jennings, & Lindsey (1990)	26	US Mint blue- & white-collar quality circles &control groups	x		x	x			x	x	x	x	x

* level of analyis was not the group

x - indicates that the study examined at least one variable under this category

Table 3. Summary of Project Team Studies

			Types of Variables Studied							Types of Outcomes Measured			
			Design			Processes		Environ.	Psycho-	Performance		Behavioral	Attitudinal
Authors	# Teams	Team Description	Task	Group Comp.	Org'l Context	Internal	External	Factors	Social Traits	Objective	Perceptions		
Project Teams													
Ancona (1990)	5	state education department consulting teams			x		x		x		x		x
Ancona & Caldwell (1992a)	45	new product development teams in high-tech firms				x	x		x		x		
Ancona & Caldwell (1992b)	45	new product development teams in high-tech firms	x	x	x	x	x				x		
Hansen (1995)	1	computer industry new product development team				x	x				x		
Henderson & Lee (1992)	41	information system design teams	x								x		
Jabri (1992)	*	R&D teams in the U.K. pharmaceutical industry	x								x		x
Keller (1994)	98	industrial R&D teams	x	x		x	x				x		
Kim & Lee (1995)	80	Korean government & private R&D teams	x		x				x		x		
Levi & Slem (1995)	*	electronics industry R&D teams	x		x	x					x		
McDonough & Barczak (1992)	32	new product development teams	x		x				x		x		
Pinto & Pinto (1990)	*	cross-functional hospital teams				x					x		
Pinto, Pinto, & Prescott (1993)	62	cross-functional hospital teams	x		x	x			x		x		x

* level of analyis was not the group

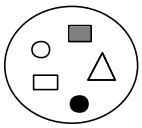
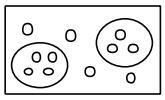
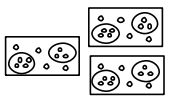
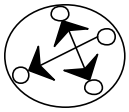
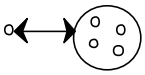
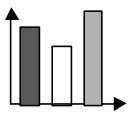
x - indicates that the study examined at least one variable under this category

Table 4. Summary of Management Team Studies

			Types of Variables Studied							Types of Outcomes Measured			
			Design			Processes		Environ.	Group	Performance		Behavioral	Attitudinal
Authors	# Teams	Team Description	Task	Group Comp.	Org'l Context	Internal	External	Factors	Psych. Traits	Objective	Perceptions		
Management Teams													
Amason (1996)	53	Food processing & furniture mfg TMTs		x		x					x		
Eisenhardt & Schoonhoven (1990)	92	New semi-conductor TMTs		x				x		x			
Finkelstein & Hambrick (1990)	100	Computer, chemical, and natural gas TMTs		x	x			x		x			
Haleblian & Finkelstein (1993)	47	Computer & natural gas TMTs		x	x			x		x			
Hambrick & D'Aveni (1992)	114	Bankrupt & matched survivor TMTs in mfg, retail, and transportation		x						x			
Isabella & Waddock (1994)	39	Banking TMTs (simulation)				x		x	x	x			
Jackson et al. (1991)	93	Bank Holding Companies TMTs		x	x					x		x	
Korsgaard et al. (1995)	20	Management teams from 3 divisions of a high-tech company			x	x					x		x
McGee et al. (1995)	210	New venture TMTs in high-technology industries		x						x		x	
Michel & Hambrick	134	TMTs from mixture of industries		x	x					x			
Schwenk (1993)	60	Oil, chemical, and computer TMTs		x						x			
Smith et al. (1994)	53	High-technology TMTs		x		x				x			
Weirsema & Bird (1993)	40	Japanese TMTs from banking, consumer electronics, food processing, and large retail sales		x								x	

x- indicates that the study examined at least one variable under this category

Table 5. Comparison Among Types of Teams
of the Key Variables Studied in the Past Six Years of Empirical Field Research

Category	Work Teams	Parallel Teams	Project Teams	Top Management Teams
 Task Design	Autonomy Interdependence Task Traits	Participation	Autonomy Task Allocation Product Traits	
 Group Composition	Diversity Size	Diversity Size		Demographics Size Diversity
 Organizational Context	Rewards Supervision			Leader Behaviors
 Environmental Factors	Client Climate			Industry Traits Market Effects
 Internal Processes	Collaboration Conflict		Collaboration	Communication Collaboration Conflict
 External Processes			Communication	
 Group Psychosocial Traits	Cohesiveness Norms Affective Tone		Problem-Solving Style	Certainty Attributions
 Effectiveness	Productivity Response Times Job Satisfaction Commitment Absenteeism Turnover Perceptions of Performance	Job Satisfaction Commitment Absenteeism Turnover Perceptions of Performance	Perceptions of: Adherence to Budgets and Schedules Innovation Project Quality Performance	Return on Equity Return on Assets Sales Growth Total Return to Shareholders Decision Quality Turnover Promotions

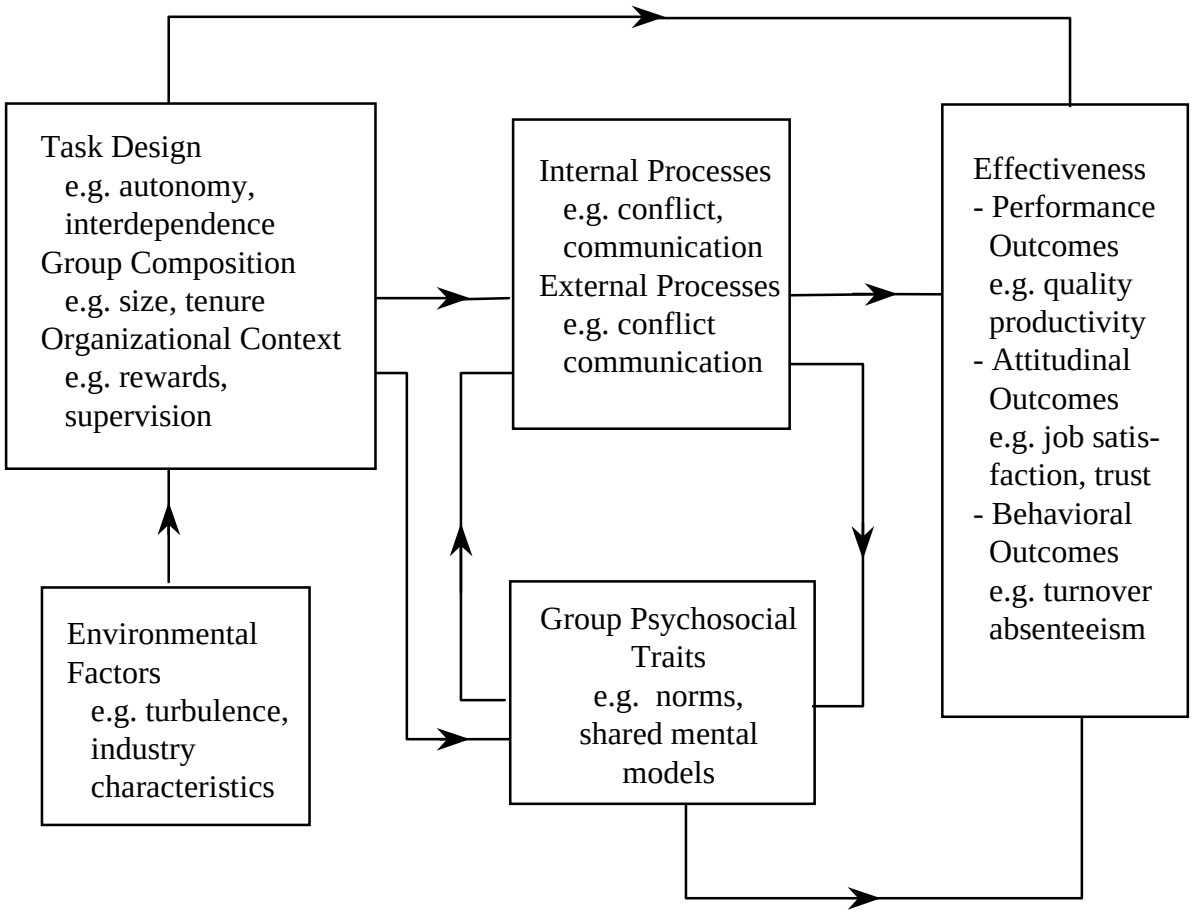


Figure 1. A Heuristic Model of Group Effectiveness.
Variables listed under each category are meant as examples; they do not constitute an exhaustive listing.