

C

E



Center for
Effective
Organizations

**WE CAN'T GET THERE UNLESS WE
KNOW WHERE WE ARE GOING**

**CEO PUBLICATION
G 98-26 (354)**

**SUSAN G. COHEN
SUSAN A. MOHRMAN
ALLAN M. MOHRMAN**
University of Southern California

November, 1998

WE CAN'T GET THERE UNLESS WE KNOW WHERE WE ARE GOING:

DIRECTION SETTING FOR KNOWLEDGE WORK TEAMS

Susan G. Cohen

Susan Albers Mohrman

Allan M. Mohrman Jr.

Center for Effective Organizations

University of Southern California

Marshall School of Business

Los Angeles, CA 90089-1421

213 740-9814 telephone

213 740-4354 fax

April 1999

ABSTRACT

In this chapter, we closely examine one set of factors that are critical for knowledge work team effectiveness --how organizations set and communicate direction for teams. The variables we examine encompass several related elements in the organization's direction-setting context: the clarity of the organization's strategy, the alignment of individual team, and organizational goals, and the measurability and specificity of those goals. We also examine goal-setting processes in teams. We present research results from a study of 173 teams from 26 business units in seven Fortune 1000 companies. In general, we find that contextual and process direction-sharing variables do positively contribute to teams developing a shared understanding of their priorities and work to be done, and also contribute to effectiveness outcomes. Developing a shared understanding contributes strongly to team effectiveness, but not to other effectiveness outcomes. Different direction setting variables relate to different aspects of effectiveness. These findings shed light on the nature of organizations that perform complex knowledge tasks and are designed to work laterally through teams. They also provide some evidence of the difficulty of the transition from a traditional hierarchically oriented system to a team-based organization.

In recent years organizations have expanded their use of teams performing knowledge work to gain competitive advantage. Most knowledge work is non-routine, dynamic, and often involves complex interdependencies. Knowledge work teams, for example, develop new products, write proposals, provide information technology support, and sell complex systems to customers. Knowledge work entails the application of specialized knowledge bases and the processing of information. People with highly developed knowledge sets, such as electrical engineers, accountants, and marketers, typically carry it out. Knowledge workers are one of the fastest growing segments of the workforce and are now one of the groups most likely to use teams (Beyerlein, Johnson & Beyerlein, 1995). The growing importance of knowledge work teams make it imperative that we understand the factors that contribute to their effectiveness.

In this chapter, we closely examine one set of factors that are critical for knowledge work team effectiveness--how organizations set and communicate direction for teams. We discuss research results from a more extensive study of the impact of the organizational context on the effectiveness of knowledge work teams. The findings reported here encompass several related elements in the organization's direction-setting context: the clarity of the organization's strategy, the alignment of individual, team, and organizational goals, and the measurability and specificity of those goals. We also discuss the impacts of goal-setting processes for teams.

Past research on knowledge work team effectiveness has been quite limited, but findings suggest that direction setting is key. These studies highlight the importance of the teams' interactions with the systems and people in the organization that provide task, goal and performance-related information to the teams. Most of the studies have been of new product development teams (for example, Ancona & Caldwell, 1992; Donnellon, 1996; Katz, 1982; Katz & Allen, 1985; and Keller, 1986) and information systems development teams (for example, Janz, Colquitt, & Noe, 1997; Campion, Papper & Medsker, 1996; and Henderson & Lee, 1992). For example, Ancona & Caldwell (1992) found that new product development team effectiveness depended upon the information exchanged through external communication with managers above in the hierarchy and laterally with peers outside the team. The

information exchanged with managers frequently concerned objectives, resources, and performance expectations; the information exchanged with peers frequently dealt with the coordination of technical and design issues. Janz et al. (1997) found that contextual factors that orient team members to what they are trying to accomplish such as high quality goals, frequent feedback, and efficient information transmission were related to team performance in information system support teams. He also found that high quality goals and efficient information transmission increased the positive relationship between team process and team effectiveness. These findings that direction-setting contextual mechanisms are related to knowledge work team effectiveness are consistent with the exhortations of team researchers who have highlighted the importance of a supportive organizational context (Campion 1993, 1996; Cohen, 1994; Gladstein, 1984; Guzzo & Dickson, 1996; and Hackman, 1987).

Other work has examined the degree to which knowledge work team members are able to collaborate to integrate diverse perspectives, and the impact of contextual features on team collaboration and performance. The challenge of integrating diverse perspectives occurs when teams are cross-functional and business solutions require application of multiple knowledge sets. A particularly important perspective is provided by the work of Dougherty (1992) who found that the varying styles of thinking and action of members from the various functions involved in new product development teams can inhibit the teams' effectiveness primarily by blocking the collaboration required to develop sufficient knowledge of the technology and market relationships. Contextual features have been found to be important barriers and facilitators of internal team collaboration. In an in-depth examination of the internal dynamics of new product development teams, Donnellon (1996) found that the roots of collaboration (or lack thereof) can be often found in contextual features; for example, in the role models provided by managers at the next level up, the goals that are passed down the organization, and the reward system. A full understanding of knowledge work team effectiveness entails an examination of not only the internal dynamics of the team, but also the extent to which organizational systems and practices support collaboration and the integration of diverse perspectives.

Because the integration of various knowledge sets through collaboration is critical for knowledge work team effectiveness, it becomes critical to understand what an organization can do to stimulate a shared understanding among team members of what they are trying to accomplish. At face value, direction setting would seem to be a key tool for that purpose. Of course, many other factors are important for knowledge work team effectiveness and for collaboration, but direction setting is likely to have a high impact and offers the possibility for successful intervention. As the chapter title suggests, teams cannot get to their destination unless they know where they are going. Shared understanding of the organization's and team's direction may serve as the foundation for integrated task performance, allowing members to align their efforts and to perform effectively. The section that follows will present our model for this study and theoretical rationale for its hypothesized links.

Model and Theoretical Rationale

Figure 1 depicts our model for this study on the impact of direction setting on knowledge work

 INSERT FIGURE 1 ABOUT HERE

team effectiveness. We hypothesize that effectiveness is a function of the characteristics of the organization's direction-setting context and processes, including strategy and goal setting, and of the shared understandings that are developed about the work to be accomplished. We expect that direction setting will have a direct positive impact on team effectiveness. Additionally, because direction setting is one of the ways in which team members develop a shared understanding of what they are expected to accomplish, we expect direction setting to relate to team effectiveness indirectly through creating shared understanding of the work to be done. The theoretical underpinnings of this model are described below. We start with the concept of shared understanding because of the central role that it is predicted to play in knowledge work settings.

Shared Understanding

Inherent in the concept of team is the interdependence of team members in accomplishing the team's task. Indeed, such interdependence is a major reason for organizing work into teams (Hackman and Oldham, 1980). Interdependence is an especially salient feature of knowledge work where there are often multiple concurrent conversion processes that influence one another (Pava, 1983) so that work can not be easily broken down into discrete sub-tasks. Such work calls for ongoing deliberation between the various parties carrying out the work.

In the traditional organization, managers were generally responsible for integration of work across interdependent contributors, including both individuals and groups. Moving responsibility for integration of work into the team itself is one of the features of teams that explains why work may be done faster with higher quality. However, this presumes that the team has shared agreement about its task strategy, including how it will organize to accomplish its task and how it will integrate its work.

When teams involve multiple deep specialties and functions, there are often quite different understandings about means and ends. Dougherty's (1992) work provides insight into why this is so. She found that the traditional division of organizations into functions has resulted in functions being different "thought worlds"—communities with quite different shared understandings based on distinct bodies of knowledge, identification of critical issues, and criteria for evaluating uncertainty. Organizational routines have developed that segment rather than integrate these thought worlds. Earlier work also found that members of various departments differ with respect to their orientation to time, purposes or goals, and style of operation (e.g., Lawrence and Lorsch, 1967). Dougherty also found that collaboration within new product development teams is impeded if members from functions such as marketing, operations, and engineering, cannot develop a shared understanding that enables them to get beyond fundamental differences in time frames, in what they consider to be the important aspects of the development process, and in how they understand the development task itself (1992, p. 187).

Shared understanding describes the extent to which these differences have been bridged and whether team members have been able to establish a common orientation to their task. It is a cognitive

variable and fits into the category of variables that Cohen and Bailey (1997) call group psychosocial traits and Klimoski & Mohammed (1994) describe as team mental models. Other researchers have also posited that if group members have a shared understanding of their work situation, then interactions will proceed in a well-coordinated matter (Bettenhausen & Murnighan, 1985) and the quality of teamwork skills and team effectiveness will be enhanced (Cannon-Bowers & Salas, 1990; Cannon-Bowers et al, 1990, 1993; Orasanu & Salas, 1993). Gabarro (1990) stressed the importance in teams conducting creative knowledge work of shared understanding or “mutual expectations” about the nature of the task and how to work together. Empirical evidence is quite limited, however. A study of knowledge sharing in a virtual team developing an innovative product found that shared understanding of language, team member roles, and of goals and priorities facilitated computer mediated collaboration (King, Malhotra, Rice, Ba, and Majchrzak, 1998). Weick and Roberts (1993) identified elements of a “collective mind” among crews on aircraft flight decks. The more heedful the interrelating of actors—i.e., the more they carried out their work envisioning the requirements of the others with whom they are interdependent-- the more developed the collective mind, and the better the performance of the flight crew.

Building on this work, we anticipate that shared understanding is a critical performance facilitator for knowledge work teams. If teams have a shared understanding of what they are trying to accomplish, their priorities, and how to approach the work to be done, members are more likely to effectively integrate their efforts and arrive at collective decisions required to accomplish the team task. Shared understanding is a broad construct that goes beyond agreement about a team's purpose and priorities, and includes agreement about the ways of getting work done. We hypothesize that:

- A. Shared understanding positively contributes to team effectiveness.

Effectiveness Outcomes

We take a multi-faceted approach to effectiveness to address the multiplicity of outcomes that matter for teams in organizational settings. We consider team performance from the perspectives of both members and key stakeholders (managers and key customers). The first measure of a team's effectiveness is its performance in carrying out its collective task. Team performance is assessed in terms

of the outputs produced by the team and includes dimensions such as costs, productivity, quality, speed, and customer satisfaction.

The larger business unit's performance is the second effectiveness outcome. The work of each team must be well aligned to contribute to its unit's business performance, and the work of multiple teams must fit together to yield effective performance at the higher system level of the business unit in which the teams are embedded. A team might accomplish its own objectives but at the same time waste resources needed elsewhere in the unit. Thus, we view the effectiveness of the larger business unit as an important criterion which reflects the team's contribution to the larger business unit.

In today's world of extreme competition in which the performance levels required to be competitive are continually escalating, most knowledge work teams are responsible not only for goal accomplishment, but also for learning how to improve their methods and procedures so that future performance is enhanced. The companies in our study all had active total quality management or process improvement thrusts (Deming, 1982; Juran, 1989), and were using task and improvement teams to solve problems and introduce improvements. They also were hoping and expecting that work teams would find new approaches to achieve ever-increasing performance levels. The extent to which a work team has made improvements in the way it operates is our third criterion of effectiveness.

Finally, we view member satisfaction as a key human outcome. If participation in teams detracts from the satisfaction of members, teams may not be viable over the long term. Including team member satisfaction as a criterion of team effectiveness is consistent with other team effectiveness researchers (Cohen & Bailey, 1997; Hackman, 1987; Sundstrom, DeMeuse and Futrell, 1990).

Organization Direction Setting Context

The setting of direction in organizations has been of interest to organizational theorists for over sixty years. Barnard (1938) viewed organizations as systems of coordinated human efforts directed toward the accomplishment of a purpose. Simon (1945) asserted that general statements of purpose and high level goals were not useful for understanding how organizations made decisions, so he defined operative goals as outcomes to which action can be related in a fairly definite way and that provide some

basis for assessing accomplishment. Goal-setting researchers have focused on the motivational value of specific, challenging goals for task performance (Locke & Latham, 1990). The three direction setting context variables that we include are: the clarity of the organization's strategy; the alignment of individual, team, business unit, and organizational goals; and the measurability and specificity of goals. People can form a common understanding of direction on the basis of these three contextual mechanisms. We will discuss each.

At the organizational level, a significant amount of research has demonstrated the importance of strategy to performance (for example, Hambrick, 1983; Hofer, 1975; Miles & Snow, 1978; and Zeithaml & Fry, 1984). Team-based organizations often give teams the responsibility for carrying out the tasks and making judgments associated with the delivery of whole services and products that are critical for successful strategy accomplishment. The development of appropriate team goals and micro strategies requires understanding of the organization's strategy. A shared understanding of the organization's strategy can help disparate team members to align their efforts and take effective collective action. The strategy can guide the difficult trade-off decisions that emerge as the team does its work. In order to inform such team-level performance, the organizational strategy has to be clearly defined and broadly communicated. For these reasons, we hypothesize that:

- 1a. A clearly defined organizational strategy contributes to enabling shared understanding of the team's direction, work, and priorities.
- 1b. A clearly defined organizational strategy contributes positively and directly to the effectiveness outcomes.

Goals motivate task performance and contribute to work satisfaction (Locke & Latham, 1990). The core premise of goal-setting theory is that goals are immediate regulators of human action and that challenging and specific goals lead to higher levels of performance than easy or vague goals (Locke & Latham, 1990; Locke, E.A., Shaw, K.M., Saari, L.M., and Latham, G.P., 1981). They motivate task performance by regulating the intensity of effort that individuals expend on their tasks and they lead people to persist in their activities until goals are reached. Goals lead people to direct attention and take

action with respect to certain activities and to ignore other activities, thereby influencing human choice. People experience satisfaction when they accomplish a challenging goal and dissatisfaction when they do not (Locke, 1976; Peters, L.H., O'Chassie, M.B., Lindholm, H.R., O'Connor, E.J., & Kline, C.R., 1982). Goals affect satisfaction by serving as a value standard by which to assess performance. We examine two aspects of the goal context in team-based organizations: the fit or alignment of goals across the various levels of the system (individual, team, business unit and organization), and the specificity and measurability of goals.

Organizational goals translate strategy into targets that guide and motivate behavior. Goals also provide a basis for shared understanding within the team of the purposes and target of work activities and enable integrated collective action. The alignment of goals at different systemic levels ensures that individual and team efforts are focused on organizational outcomes. If there is a lack of fit between goals of the individual and the team, then much individual effort may not contribute to and in fact may be at cross-purposes with team goals. Team performance may not fully contribute to business unit performance if the team's goals are not aligned with business unit goals, and if the team optimizes its own performance at the expense of the performance of the larger organizational system. If goals are aligned, team members are more likely to develop a shared understanding of where their effort and their team's effort fit into accomplishing broader business objectives. Thus, we examine goal alignment between individual, team, business unit, and company goals, and hypothesize that:

- 2a. Goal alignment contributes to enabling shared understanding of a team's direction, work, and priorities.
- 2b. Goal alignment contributes positively and directly to the effectiveness outcomes.

Finally, goals should be specific and measurable. Goal-setting studies have shown repeatedly that people who try to attain specific and challenging goals perform better on a task than people working with vague goals like "do your best" or no goals at all. This finding has been verified by both literature reviews (Latham & Lee, 1986, Locke et al., 1981) and meta-analyses (Mento, Steal, & Karren, 1987; Tubbs, 1986). It has been replicated in more than 400 studies involving 40,000 subjects and is one of the

most robust findings in the social psychological literature (Locke & Latham, 1990). Although most of these studies deal with individual goal-setting and performance, studies of group goal-setting have also found that specific goals lead to better performance than unspecific, vague goals (for example, Cohen, 1959; Ishida, 1980; Latham & Kinne, 1974; Latham and Yukl, 1975; and Watson, 1983). In a team setting, having specific quantifiable team goals helps members to direct their efforts toward the same end. Members become less likely to perform activities not related to the team goal.

It can be argued that having clear and specific goals is particularly critical for knowledge work teams, due to the difficulty of integrating efforts of people from different “thought worlds” (Dougherty, 1992). People in different specialties have different understandings of such basic performance categories as customer responsiveness or quality. They attach different meaning to vague or general goals such as “meet customer need”. In such settings, very clear and specific goals may serve as a common focus and a springboard for integrating their perspectives, knowledge and contribution into an effective team work system. Measurability indicates an extreme level of specificity in that goals are expressed in terms commonly understood and “objectively” determinable. Thus, we hypothesize that:

- 3a. Measurable goals positively contribute to a shared understanding of the team’s direction, priorities, and work.
- 3b. Measurable goals positively and directly contribute to effectiveness outcomes.

In general, each of the direction-setting contextual mechanisms has a cognitive and motivational impact on performance outcomes. They orient members and help them decide what to do and not to do, as well as regulate the intensity and persistence of effort that team members apply to their tasks. Although it is possible that different mechanisms will have differentiated impacts on our four major criteria for effectiveness, neither previous research nor theory provides an a-priori foundation for making differentiated hypotheses.

Goal-Setting Processes

In team-based settings, goal-setting processes need to take place both hierarchically and laterally. Because teams are nested in business units that are in turn nested in the broader organization, a

hierarchical goal-setting process is required to achieve the alignment of goals across the systems levels. Goal-setting that occurs hierarchically in the organization helps ensure that the goals at each systemic level contribute to those at higher levels and contribute to organizational performance. Managers and supervisors have a key role in ensuring that this cascading process occurs. We will use the term "supervisor goal-setting" to identify this hierarchical goal-setting process.

A hierarchical process may not be enough to ensure alignment across and within teams. Lateral goal-setting processes may also be required. Teams in knowledge work settings are likely to be interdependent with other teams and co-performers, and goals may need to be aligned across them. Teams may need to negotiate their goals with other teams to make sure they are compatible, particularly if their work impacts each other or if they rely on each other for support or input. Similarly, the members of teams are interdependent with one another, and their work requires collaboration. Such collaboration is more likely if the goals of various team members are compatible and support collective team goals (Donnellon, 1996). Team members who participate together in the setting of goals learn about each other's requirements and the team's requirements for performance; this may make it easier for each member to perform in a manner that takes others' requirements into account (Weick and Roberts, 1993). In a team-based organization, a participative goal-setting process entails not only efforts by supervisors to involve subordinates in a hierarchical goal-setting process, but also engagement of co-workers laterally in a collective process. We use the term team goal-setting to describe this lateral process. Thus, we hypothesize that:

- 4a. Supervisor goal-setting processes positively contribute to shared understanding of the team's direction, work, and priorities.
- 4b. Supervisor goal-setting processes positively contribute to effectiveness outcomes.
- 5a. Team goal-setting processes positively contribute to shared understanding of the team's direction, work, and priorities.
- 5b. Team goal-setting processes positively contribute to effectiveness outcomes.

We are not differentiating our predictions among effectiveness criteria about the impact of supervisory and team goal-setting processes. Existing theory and research does not provide sufficient justification for differentiated hypotheses.

Study Methods

We used a cross-sectional survey method to test the hypotheses. Individual team members responded to questions about the direction-setting context, goal-setting processes, their team's shared understanding, and team and unit performance. Survey measures of team effectiveness were also collected from managers and customers who had a stake in the team's work. These key stakeholders of team performance provided an external source of performance ratings. Team member and stakeholder surveys were administered in the same general time period. Prior to administering the surveys, we conducted field interviews with team members and managers in each business unit to obtain more detailed information and insight about the settings.

Sample

We studied 173 teams from 26 business units in seven Fortune 500 corporations. The companies were in the aerospace, computers, consumer products, pharmaceuticals, and telecommunications industries. The business units and the teams within them were responsible for new product development programs, product commercialization activities, information technology support, human resource support, and customer sales and services.

Table 1 presents individual and team level response rates for our sample. The demographics of the final sample were not appreciably different from those of the sample as a whole. Our analyses are based on a final sample of 108 teams. Table 2 summarizes the member-level and team-level characteristics of the sample. These characteristics illustrate how different these knowledge work teams are from the prototypical production team in their multi-disciplinary composition, changing memberships, non-dedicated members, geographically dispersed memberships, multiple reporting relationships, and highly educated members.

INSERT TABLE 1 AND TABLE 2 ABOUT HERE

Measures

Effectiveness. We measured five aspects of team effectiveness: self-ratings of team performance, stakeholder ratings of team performance, team member ratings of unit performance, member reports of improvements introduced in the team, and self-ratings of satisfaction. Team performance was measured by a 10 item scale which included the following criteria: customer satisfaction, continuous improvement, quality, speed, innovation, utilization of key skills, employee commitment, productivity, costs, and overall performance. Team members were asked: “Compared to what you think is possible, how effective is your team in each of the following performance areas? Fill in the percentage in the space below. (For example, 80% = eighty percent of what you think is possible.)” Stakeholders were asked the same questions for the team they were evaluating. All reliabilities are calculated at the individual level. The alpha for the team self-rating of performance is .96 and the alpha for the stakeholder rating is .94.

Team members were asked to evaluate the performance of their business unit as well. The questions included the same criteria and followed the same format as those about team performance. The alpha of business unit performance is .95.

Improvements were measured by a six item scale ($\alpha = .84$). Team members were asked to what degree in the past year there had been accomplishments in the following: 1) “Introduced better tools for doing our work”; 2) “Introduced better ways to organize”; 3) “Made improvements in our methods”; 4) “Improved our work processes”; 5) “Improved coordination of work”; and 6) “Found better ways to manage”. Response codes ranged from one to three (1=no accomplishments, 2 = some accomplishments, and 3 = significant accomplishments.)

Satisfaction was measured by a five item scale ($\alpha = .91$) that adapted items from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). Two items

measured job satisfaction: “All in all, I am satisfied with my job.” And “ in general, I like working here.” Growth satisfaction was measured by 3 items. “I am satisfied with the chances I have to...” 1) “...learn new things.”, 2) “...accomplish something worthwhile.”; and 3) “...do something that makes me feel good about myself as a person.” These five items factored together, so we decided to use a combined scale. Response codes ranged from 1= strongly disagree to 7 = strongly agree.

The four effectiveness scales measured by team member questionnaires were confirmed by factor analysis using principal component extraction and varimax rotation to be measuring four orthogonal dimensions of effectiveness.

Shared Understanding. We designed the shared understanding scale specifically to measure several areas of possible agreement among team members. The scale items were: 1) “There is agreement about our priorities;” 2) “People do not agree on what’s really important” (reverse scored); 3) “We have a shared understanding of what we’re trying to accomplish;” and 4) “There is an agreed to way of getting the work done”. Response codes ranged from 1 (strongly disagree) to 7 (strongly agree). These items form a scale that withstands all factor analytic attempts to break it apart, and shows good internal consistency ($\alpha = .79$). The scale measures general agreement (as opposed to agreement about a specific referent, such as goals or processes.)

Organizational Context. We included three measures: clear organizational strategy, goal alignment, and measurable goals. Clear strategy had four items ($\alpha = .83$): 1) “This organization has a clear strategic direction;” 2) “The strategy of our organization is not well-defined(reverse scored);” 3) “There seem to be conflicting strategies at work(reverse scored);” and 4) “Top management seems unclear about where the organization is going(reverse scored).” (1=strongly disagree to 7=strongly agree).

Goal alignment was measured with three items ($\alpha = .72$), asking for the fit between individual goals and team goals, team goals and the larger business unit’s goals, and the business unit’s goals and the company’s goals. (1 = strong misfit to 5 = strong fit).

Measurable goals was measured with two items ($\alpha=.75$): “Our work has quantifiable targets.” And “Our work has measurable outcomes.” (1=strongly disagree to 7 = strongly agree).

Processes. We included measures of hierarchical and lateral goal-setting processes. For the hierarchical measure, we asked “My immediate supervisor makes sure we have clear goals” and “My immediate supervisor makes sure everyone knows what has to be done.” This two item scale had an alpha of .86. For our measure of lateral goal-setting, we asked the same two questions with respect to people with whom the respondent worked. “We make sure we have clear goals.” And “We make sure everyone knows what has to be done.” This alpha was .84. (1=strongly disagree to 7 = strongly agree).

The six explanatory scales (shared understanding, three context measures, and two process measures) were confirmed by factor analysis using principal component extraction and varimax rotation to be measuring six orthogonal dimensions.

Level of Analysis

All analyses were conducted at the team level of analysis. Anova runs across the 132 teams with sufficient data confirm that for each variable measured by the team member questionnaire, the variation between groups is significantly greater than the variation within groups.

Results

This section is organized in the following way. First, we present descriptive statistics for our measures and report the results from the correlation analyses. Second, we present the overall results from testing the proposed model using multiple regression. Third, we present the results from testing our hypotheses of the proposed linkages in the model. We conclude by summarizing the key findings.

Descriptive Statistics

Table 3 shows the team-level means, standard deviations, and intercorrelations for all variables. Scale reliabilities (in the form of coefficient alphas calculated at the individual level) are shown on the diagonal.

INSERT TABLE 3 ABOUT HERE

The relationships between the measures by team members and the single measure of stakeholder evaluations of team performance may be of most interest because these data are not produced by a common method. The stakeholder measure of team performance is highly correlated with the member self-rating of performance (.63). This correlation between the stakeholder assessment and team assessment of team performance is much higher than any other correlation between the stakeholder assessment of team performance and the other measures of the study. Furthermore the pattern of correlations of stakeholder ratings with other measures corresponds to the pattern of correlations between member self-rating of team performance and the other measures, with the exception of goal alignment and satisfaction. The intercorrelation between the team and stakeholder rating of team performance and their similar correlation patterns with other measures are consistent with the assertion that both methods are measuring common attributes of team performance. Since the stakeholder measure of team performance is also significantly correlated with many of the other measures in the study, we conclude that the preponderance of significant correlations in the table as a whole cannot be attributed just to common method bias.

Other relationships among the outcome measures are also of interest. The team's ratings of their own performance and of business unit performance are strongly related ($r=.71$), as would be expected given that they are both generated by a single method and the same respondents. Business unit performance is significantly but less strongly related to stakeholder ratings of team performance ($r=.37$). These three measures are of outcome performance along dimensions such as cost, quality, speed and so forth. The two other effectiveness measures, improvements, and satisfaction, are measures that are more subjective in nature and would be less apparent to those outside the team. Team member satisfaction relates quite strongly significantly to improvements, and less strongly to team self-ratings of its own and the business unit's performance, but not at all to stakeholders' ratings of the team's performance.

Likewise, improvements relates to business unit performance but not to either rating of the team's performance. Thus it appears that although there is agreement internally and externally about the team's performance, our other measures of effectiveness are indeed picking up a different set of outcomes. With the possible exception of the relationship between satisfaction and team self-rating of performance, the relationships between the various measures of performance and the improvement and satisfaction measures do not appear to be strongly impacted by a single method bias.

Given the fact that most of the intercorrelations in Table 3 are significant, multiple regression analysis is necessary to cut through this web of intercorrelations to test our model and hypotheses.

Testing the Model

We tested the model illustrated by Figure 1 using path analyses created by first regressing the predictor variables on shared understanding, and then regressing them, along with shared understanding, on each of the five effectiveness outcomes. We also did a stepwise regression entering the five predictor variables in the first step and shared understanding in the second, to examine the impact of the addition of shared understanding on the change in R2 for each of the dependent variables. Table 4 shows the results

 INSERT TABLE 4 ABOUT HERE

from these analyses. All of the tests of the overall model are significant, explaining from 21% to 53% of the variance in the dependent variables. These results show that, in general, direction setting contextual and process mechanisms are important for developing shared understanding and, along with shared understanding, are important contributors to effectiveness.

Testing the Hypotheses

Table 4 also shows the results from testing each of the hypotheses. The beta weights and their significance levels highlight the relationships between each of the predictor variables and the performance facilitator and effectiveness outcomes.

Hypothesis A predicted that shared understanding positively contributes to the effectiveness outcomes. This hypothesis was supported for two of the five outcome measures. Shared understanding contributes to self-ratings and stakeholder ratings of team performance. It does not positively contribute, however, to unit performance, improvements, or to satisfaction. When shared understanding was added into the regression model in a stepwise fashion, the same results occur. The changes in R² are significant for self-ratings of team performance and stakeholder ratings of team performance, but not for each of the other dependent variables. Shared understanding, therefore, acts as a performance facilitator only at the team level and only for performance outcomes. It is not surprising that shared understanding has no effect on unit performance, as we operationalized shared understanding at the team level. Our improvements scale, likewise, may be picking up phenomena at a higher level of analysis, relatively unaffected by shared understanding within the team; but we still would expect that some improvements took place within the team setting and the lack of relationship demands an explanation.

Hypothesis 1a predicted that a clearly defined organizational strategy contributes to shared understanding of the team's direction, work, and priorities. Hypothesis 1a was supported.

Hypothesis 1b predicted that a clearly defined organizational strategy contributes positively to the effectiveness outcomes. Hypothesis 1b was supported for three out of five effectiveness outcomes, for team ratings of team performance, stakeholder ratings of team performance, and unit results. Interestingly, having a clearly defined strategy had no impact on making improvements in methods and work processes or on team member satisfaction. In retrospect, one might conjecture that strategy is relatively independent of the particular methods used by a team and so, therefore, is the clarity of the strategy. Strategy is also relatively remote from the personal issues of team members and therefore has little impact on team satisfaction.

Hypothesis 2a predicted that aligned goals contribute to shared understanding. It was not supported. Having goals aligned at multiple levels did not enable a shared understanding of the team's direction, work, or priorities.

Hypothesis 2b said that goals aligned at multiple levels contribute positively to effectiveness outcomes. The results were mixed and show a very interesting pattern. Goal alignment predicted unit results, but is negatively related to stakeholder ratings of team performance and not related to team self-ratings. Apparently the alignment of goals across the system levels operates largely to promote system level performance, not the performance of a particular unit. Furthermore, such vertical alignment evidently does not always serve the interests of all the various stakeholders of the team.

Goal alignment does predict team satisfaction. Our measure of goal alignment specifically refers to the individuals' goals as well as those of the larger units. Alignment of individual goals with the goals of the larger units may be an important determinant of satisfaction. Alternatively or in addition, the overall alignment of goals in the business unit may contribute to satisfaction by reducing the frustration that people feel when people and units work at cross-purposes.

Hypothesis 3a predicted that measurable, quantifiable goals contribute to shared understanding. It was not confirmed, although the relationship is significant if the standard for significance is lowered to a .10 level of significance.

Hypothesis 3b predicted that measurable goals contribute to the effectiveness outcomes. Measurable goals did contribute to unit results, providing some support for this hypothesis. Interestingly, measurable goals did not contribute to any team level outcome. These findings suggest that the measurability of goals of the smaller (team) unit may serve primarily to enable performance at the higher (business unit) level. Perhaps having measurable goals creates a way of making sure multiple teams in a unit achieve performance specifically needed by the unit, and that a team's performance dovetails with the performances of other teams (Galbraith, 1994).

Hypothesis 4a predicted that supervisor goal-setting processes contribute to shared understanding in the team. It was supported, although the relationship is not particularly strong.

Hypothesis 4b predicted that supervisor goal-setting processes positively contribute to the effectiveness outcomes. It was not supported with respect to the performance outcomes or improvement. Thus, supervisor goal-setting activities do not relate to team or business unit performance outcomes

except through the indirect route via team shared understanding. Supervisor goal-setting processes do relate to members' satisfaction with their jobs and growth opportunities. Thus, supervisor processes seem to relate most directly to affect and cognition, and not directly to collective performance. This finding may also be related to the findings of the relationship between goal alignment and team satisfaction. These may imply that people like to have some authoritative (hierarchical) criteria by which they can gauge what they are supposed to do and whether they have done it.

Hypothesis 5a predicted that team goal-setting processes positively contribute to the team's shared understanding of its direction, work, and priorities. It was confirmed. Team goal-setting processes strongly predicted shared understanding.

Hypothesis 5b predicted that lateral goal-setting positively contributes to the effectiveness outcomes. It was not supported in most cases. However, team goal-setting was the only predictor variable that positively (and strongly) contributed to improvements in work processes and methods. Such improvements presumably would result in subsequent performance improvement. It is interesting, however, that these team processes seem to result in attention being paid to work processes and methods while supervisor goal-setting does not. On the other hand, team goal-setting does not relate to team satisfaction.

Summary of Findings

In general, our proposed model was supported in that contextual and process direction setting variables do positively contribute to teams developing a shared understanding of their priorities and work to be done, and also contribute to effectiveness outcomes. However, the support for the study's hypotheses is far more particular.

Having a shared understanding was important for team performance, but not for unit performance, improvements, or member satisfaction. The only predictor variable that contributed both to shared understanding and to all of the performance outcomes was the clarity of the organization's strategy. Two other contextual measures, measurable goals and goal alignment, contributed to unit performance, but not to shared understanding. Thus, all three contextual variables contributed to unit

performance. The two process variables, supervisor goal-setting and team (lateral) goal-setting, related to shared understanding. Therefore, although they had no direct impact on performance measures, they did have an indirect impact on team performance measures through their impact on shared understanding. The only predictor of improvements was team goal-setting. Goal alignment and supervisor goal-setting predicted team member satisfaction.

Discussion

The results of this paper confirm the importance of shared understanding to team performance, and the overall importance of both contextual and process aspects of direction-setting because of their direct impact and their indirect impact through shared understanding on the various facets of effectiveness. Perhaps the most interesting aspect of these findings is the extent to which different direction setting measures relate to different aspects of effectiveness. These findings shed light on the nature of organizations that perform complex knowledge tasks and are designed to work laterally, through teams. They also provide some evidence of the difficulty of the transition from a traditional hierarchically oriented system to a team-based organization.

Shared Understanding and Effectiveness Outcomes

As predicted, shared understanding is a performance facilitator for knowledge work teams. Previous work and theory suggested that when work requires judgmental decision-making and complex interdependencies between contributors with substantially different knowledge bases, lack of a common understanding impedes task effectiveness. That both the teams themselves and their stakeholders rated performance higher in teams that reported higher shared understanding is strong confirmation of this line of reasoning.

A team's shared understanding, however, was not related to unit performance. This can be explained by the difference in levels of analysis. The shared understanding measure is a team level measure—of its own priorities, goals, and work approaches--and thus would primarily impact how it performed its own task. In other work, we have found indications through qualitative observation and interviewing that lack of shared understanding across the business unit can interfere with the ability of the

unit as a whole to perform effectively, especially when there are strong interdependencies between the various teams (Tenkasi, Mohrman, & Mohrman, 1998). However, unit-wide shared understanding was not measured in this research.

Surprisingly, shared understanding was not related to improvements. Perhaps improvement had not assumed salience in the eyes of team members as a purpose and a priority of their group. Most of these companies were in the midst of strong competitively driven performance pushes, in a few cases with survival at stake, and this emphasis may have translated to teams as a pressure for immediate performance with little focus on improvement.

The lack of relationship between shared understanding and satisfaction is a surprising and intriguing finding. Satisfaction is strongly related to the hierarchical alignment and supervisory processes but not to shared understanding within the team. This is reflected in our qualitative observations that team members seemed most frustrated by events external to the team that interrupted their continuity and kept them from focusing on their task. For example, team members expressed frustration when their team or individual goals and work were externally redefined midstream causing rework and delay, or when members were pulled from the team to help with other business unit priorities. They were also dissatisfied when the messages they received from their supervisor contradicted the organizational messages of the importance of the team and its goals. In many cases, these contextual occurrences seemed to team members to be evidence that the organization didn't support teams, or at least their team. Thus, any impact of internal shared understanding within the team may be quite small compared to the contextual features that shape satisfaction. The determinants of team satisfaction are discussed in more detail in a later section.

Developing Shared Understanding

Having a clear organizational strategy and using goal-setting processes enable knowledge work teams to develop shared understanding. However, it is surprising that we did not find our other contextual measures--measurable goals or goal alignment--to be similarly related to shared understanding. Much has been written about the importance of measurable goals as a target to focus the team's efforts.

Indeed, in our study, measurable goals almost achieves a significant relationship to shared understanding, but in these data we certainly cannot say it is a major contributor. Apparently measurable goals provide a target, but do not provide meaningful cues about priorities, what's really important, or how to go about achieving them. Goal alignment, which aligns individual goals with the team and the team's goals with the larger business unit, is not at all related to shared understanding within the team.

This pattern of findings may reflect the nature of knowledge work settings. The work is uncertain and the settings are often dynamic. It may be that in such environments, goals and goal-alignment are more fleeting. Indeed, in our study, teams reported that goals changed frequently as the organization's priorities changed in response to changes in the environment. In such settings, strategy may be the key contextual touchstone that helps frame for a team a common understanding of its purpose. In this study, shared understanding refers to the cognitive understandings by the team as it carries out the judgmental parts of its work, including perhaps how it adjusts to the ongoing changes that it encounters. In knowledge work teams, agreement about targets or alignment of targets may be less important to shared understanding than if work is routine and the targets are in fact the purpose.

Team goal-setting processes strongly contributed to shared understanding, and supervisor goal-setting processes also contributed, but less so. The sensitivity of shared understanding to process variables is consistent with prior research. Others studying knowledge work have noted that to a large extent teams develop a shared understanding through their own interactions. Dougherty (1992), for example, has talked about the need for successful new product development teams to create new routines to underpin true collaboration. She points out that the issue is far deeper than goals, although this research suggests that the goal-setting processes are key contributors. King et al. (1998) found that one of the areas in which distributed, interdependent teams need to coordinate and establish a shared meaning is precisely around priorities and goals.

System Levels, Directionality, and Performance

A team-based organization is best thought of as a system in which teams are sub-units nested in a larger business unit and individuals are elements within teams (Mohrman et al.,1995). The business units

may in turn be nested in divisions or still larger business units. Whereas the traditional organization has a primarily hierarchical orientation to direction, control, and integration, the team-based organization has both a hierarchical and lateral orientation. Teams may have responsibility for a whole piece of the business, for example for a product or service, but work must also be done and decisions made that attend to business-unit wide performance and provide direction for and integrate the contributions of units at lower levels, like teams. Thus, hierarchical decisions are those made with a broader scope of focus; there is still an important hierarchical role to be played whether teams are “self-managing” or not. On the other hand, as mentioned earlier in the chapter, much that is done hierarchically in a traditional organization is performed laterally in a team-based organization. For example, the coordination of the work entailed in producing the team’s product or service is done within the team. It is clear that goal-setting also must occur laterally in the team.

The findings from this research confirm the importance of both hierarchical and lateral processes in team-based organizations. There were several direction-setting measures that were primarily hierarchical in nature: goal alignment, strategy, and supervisor goal-setting. These had mixed impact. We expected and found that goal alignment across the various levels of the system would be a major enabler of unit-wide performance because it lines up performances across levels. What is more surprising is that it does not relate to team performance at all, and in fact is negatively related to stakeholder ratings of team performance. This may reflect a dynamic by which the vertical alignment of activities contradicts the needs of lateral stakeholders who may require performances from the teams that are not captured when the team focuses mainly on issues of higher, managerially defined, system need. Our goal alignment variable does not capture horizontal alignment, which may be quite important in knowledge work team settings. The importance of lateral processes is also underscored by the finding that another of the key hierarchical variables, supervisor goal-setting, relates neither to unit level nor directly to team performance, although it does contribute indirectly to team performance through its relationship to shared understanding, which we have argued promotes effective lateral interaction within the team.

In light of the literature, one of the most surprising findings of the study is that although the team's having measurable goals relates directly to the unit's performance, measurable goals does not relate directly, and only marginally indirectly, to team results. We might best think of these goals as linking the team's efforts to the larger unit's performance goals. However, the fact that this vertical alignment to the larger system may be the major contribution of measurable goals should not lead us to think of the goal-setting process as primarily a hierarchical mechanism, especially in light of the finding that the team's internal goal-setting processes relate to shared understanding and thus to team performance. Team goal-setting appears to be a bridge between the more hierarchical aspects that align pieces of the system and the team's own internal dynamics that lead to team performance.

Perhaps the best way of conceptualizing these overarching dynamics is that a primarily vertical process, strategy formulation and communication, provides the framework within which teams can set goals that contribute to the larger unit's effectiveness and provides a shared understanding within the team that facilitates team performance. The vertical contextual processes of alignment and even measurability largely service performance at the larger system level. However, they have to be supplemented by lateral processes. Alignment is often fleeting in such a rapidly changing world, as is evidenced by the number of team settings in which business unit decisions redirected team and individual effort even during the short course of our study. Thus, using strategy as the beacon and making sure that teams set goals in support of that strategy may be the best that hierarchical processes can do. The ongoing adjustments to goals and activities that have to be made both within and across teams because of the dynamic nature of the organization may be best left to lateral processes.

Improvement

The third measure of team effectiveness is improvement. Our data show that the only direction setting variable that explained the team's effectiveness in this arena is the extent of team goal-setting. This matches our experiences in the field, where we often saw that the immediate companion of team goal-setting was not performance itself but planning for and development of the team's resources, tools, and processes that were required for performance in achieving the goals set. In fact team goal-setting

often took place in the context of the team planning for performance improvement, and vice versa. While we were not able in this cross-sectional study to measure the long-term performance results of improvements, one clear message from our data is that the same processes (team goal-setting) that lead to improvements in work process, methods, and structural improvements also contribute to a shared understanding, which in turn contributes to immediate performance.

Interestingly, in Table 3 improvement correlates significantly with performance at the unit level ($r=.24$) and not at all with the two team-level performance measures. This may be because the locus of initiation for process and methods improvement may be the broader business unit. This does not mean, however, that team level improvement, team goal-setting processes, and shared understanding are irrelevant. Other studies have found that a great deal of local focus and learning is required in each of the teams and units of a larger business unit that is attempting to implement work improvements (e.g., Orlikowski, 1996). Shared understanding and collective direction-setting are critical to such local learning processes (Tenkasi, Mohrman and Mohrman, 1998).

Team Satisfaction versus Team Performance

The results highlight different dynamics that lead to performance and satisfaction. The paths that lead to satisfaction are the more direct and obvious. People in the team are satisfied when persons in hierarchical authority positions (supervisors) set goals for them, and when they have goals that are clearly articulated within a hierarchy of goals at the team, unit, and organization level. This may reflect the vestiges and reality of hierarchy. Team members feel that their fate and indeed the fate of their team depends on hierarchical decisions. Individually, people's job assignments, appraisals, rewards, and careers are perceived to depend more directly on supervisory decisions than on the team. Furthermore, assignment to the team was full time for only one third of the respondents. The rest were on multiple teams and often had other individual assignments as well, so that their focus was by definition beyond the team. At the team level, funding and other resources and overall direction depend on higher level decisions about the unit as a whole. If the business unit is performing well, the team may experience fewer disruptions and be better able to carry out its own mission in a way that is satisfying to its members.

Furthermore, in these knowledge work settings there was a great deal of interdependence between teams, and teams were expected to work out interdependencies to support business unit performance.

If we were to design direction-setting mechanisms solely on the basis of what satisfies people, however, we would miss the mechanisms that lead to team performance, mechanisms that are less obvious and more indirect than those that lead to satisfaction. Team performance in these organizations is directly related to having a clear business strategy and a shared understanding among team members about their direction as a team. Clear strategy and, to a lesser extent, supervisor goal-setting appear to help the team develop shared understanding, but the strongest contributor to shared understanding is team goal-setting--a process that occurs within the team. The direction setting mechanisms that enable and in fact require local sense-making lead to team performance. On the other hand, except for supervisor goal-setting, these mechanisms do not relate to member satisfaction. The direction setting mechanisms that tell the team what performances are hierarchically required relate to satisfaction. For example, goal alignment tells the team how it fits into business goals. Clear business strategy helps the team to develop the shared understanding that enables it to determine what to do. Team goal-setting does not touch team member satisfaction like supervisor goal-setting does. In fact it is common to find teams demanding that their supervisors set their goals, perhaps for the reasons stated above. In our data supervisor goal setting and team goal setting are not mutually exclusive. They have an intercorrelation of .36 (Table 3). Table 4 shows that some part of the variation in supervisor goal setting ($\beta=.15$) leads to shared understanding in the team. In some team settings the roles of supervisor and team in goal setting seem to coexist comfortably, apparently creating both satisfied and productive teams.

Implications of the Study

This study suggests that in team-based knowledge work settings overall system performance requires both hierarchical and lateral direction setting. It suggests that we cannot simply extrapolate from findings in hierarchical organizations concerning the importance of contextual and process variables. The introduction of structures to perform work laterally creates a need to stimulate lateral processes in order for lateral structures to be effective. A fertile field for investigation is the interaction between contextual

and process features that follow a hierarchical logic and those that follow a lateral logic. This is in part a unit of analysis issue. Different direction setting approaches impact different systemic levels. However, it goes beyond that, and system dynamics must be explained in terms of lateral and hierarchical contextual features.

Additionally, this study suggests the need for more research that contrasts knowledge work settings where the work is non-routine, uncertain, and dynamic, with those that perform more routine, structured work. In this study, all of the teams performed knowledge work and most were in highly dynamic, uncertain environments. Our hypotheses were predicated on the type of work that we studied. However, future studies might examine whether these same factors are true of all team settings, not just those that perform knowledge work.

These findings also have far reaching implications for management processes and practice in knowledge work teams settings in particular, and perhaps more generally in today's dynamic world where the value added by work increasingly stems from knowledge. They call for a greater balance between the lateral and the hierarchical dimensions of performance for teams, the core performing units of the team-based organization, to be effective, and for the system to be able to work out the core interdependencies and handle uncertainty laterally. The strong relationship of team goal-setting to shared understanding, which is in turn related to team performance, is a strong indicator of the importance of such lateral processes. Although not measured in this study, lateral processes across teams in the business unit are likely to be equally important for unit-wide shared understanding and performance. In fact, the increasing number of unit spanning teams and networks attests to the need for such processes. Many of the teams in this study are themselves structural approaches to achieving shared understanding across previously separate disciplines and departments within business units. This study underscores the importance of a true systems approach to direction setting, including both its contextual and process aspects.

These findings also carry strong implications for transition to a team-based organization. First, it is clear that the organization will have to find ways to promote lateral processes that have not been strong in the traditional organization. The study supports earlier observations that the role of the supervisor

changes substantially (Manz & Sims, 1989; Fisher 1993; Wageman, 1997) in particular in terms of the direction-setting process. Supervisors must find their new role with respect to lateral goal-setting processes.

The strong relationship of the hierarchical processes to member satisfaction points out another significant transitional challenge. Organizational members have been conditioned to focus on vertical direction. In particular, pleasing the supervisor has been a primary route to personal career and financial success in the traditional organization. The organizations in this study had not fundamentally changed many of the organizational manifestations of this logic. Evaluations, rewards and promotions were still primarily doled out through formal processes led by supervisors. Gradually this is changing, as organizations introduce variable, team-level compensation schemes, initiate 360-degree appraisal forms, and give higher priority to lateral career movement. If the old hierarchical processes predominate, however, team members will have to keep one ear attuned to vertical processes perhaps at the expense of team performance.

Limitations and Strengths of the Study

This study has some clear limitations. It is primarily a cross-sectional study, which raises issues with regard to causal inference. However, the fact that the model tested in this study was derived not only from previous research but also conforms to our in-depth qualitative findings gives us some degree of confidence that we are studying key issues. A particularly limiting issue with respect to causality is that we can only speculate about the importance of improvements for increasing performance over time.

Another weakness of the study is that most of our measures were derived from the same questionnaire. The task of finding common hard performance measures for multiple companies and even for different units within the same company proved impossible to accomplish. In a few cases, the organizations we studied didn't even keep team-level or business level metrics. However, we derive confidence from the convergence of team self-reported performance and independent stakeholder ratings, and from the fact that team reports of team performance, of self-improvement, and of business unit performance operate differently with respect to the independent variables.

Finally, we are limited by what we studied. Our discussion has speculated beyond our data. For example, we have not looked at all at the impact of direction setting on individual performance within teams. Nor did we include any direction setting variables that look laterally across the various teams in the business unit. And of course there are a host of variables, contextual and process, that relate to team performance in addition to those that have to do with direction setting that have not been addressed in this study.

On the positive side, the study had a robust sample size of teams, and the fact that they came from multiple companies and represented many types of knowledge teams provides confidence in the generalizability of these findings to other knowledge work settings. On the theoretical side, it has clarified the determinants of team performance by taking a systems look at the various direction setting mechanisms in an organization and has seriously explored the issue of multiple levels of the organization whose performance must be simultaneously considered and balanced. In addition, the study takes some first steps at measuring lateral and hierarchical aspects of the organization. This dimension is key to the study of emerging organizational forms and may require fundamental changes in our body of theory, research methodology, and practice.

References

- Ancona, D.G. & Caldwell, D.F. (1992). Bridging the boundary: External activity and performance in organizational teams. Administrative Science Quarterly, 37(4), 634-665.
- Barnard, C.I. (1938). The functions of the executive. Cambridge, Ma.: Harvard University Press.
- Bartunek, J. (1984). Changing interpretive schemes and organizational restructuring: The example of a religious order. Administrative Science Quarterly, 29, 355-372.
- Bettenhausen, K.L. & Murnighan, J.K. (1985). The emergence of norms in competitive decision-making groups. Administrative Science Quarterly, 30, 350-372.
- Beyerlein, M.M., Johnson, D.A. & Beyerlein, S.T. (Eds.). (1995). Advances in interdisciplinary studies of work teams: Knowledge work in teams (Vol. 2). Greenwich, CT: JAI Press.
- Cammann, C., Fichman, M., Jenkins, D.G. & Klesh, J.R. (1983). Assessing the attitudes and perceptions of organizational members. In S.E. Seashore, E.E. Lawler III, P.H., Mirvis, and C. Cammann (Eds.), Assessing organizational change. (pp. 71-138). New York: Wiley-Interscience.
- Campbell, J.P. & Gingrich, K.F. (1986). The interactive effects of task complexity and participation on task performance: A field experiment. Organizational Behavior and Human Decision Processes, 38, 162-180.
- Campion, M.A., Medsker, G.J., & Higgs, A.C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. Personnel Psychology, 46, 823-850.
- Campion, M.A., Papper, E.M., & Medsker, G.J. (1996). Relations between work team characteristics and effectiveness: A replication and extension. Personnel Psychology, 49, 429-452.
- Cannon-Bowers, J.A. & Salas, E. (1990). Cognitive psychology and team training: Shared mental models in complex systems. Paper presented at the annual meeting of the Society for Industrial and Organizational Psychology, Miami, Florida.
- Cannon-Bowers, J.A., Salas, E. & Converse, S.A. (1990). Cognitive psychology and team training: Shared mental models in complex systems. Human Factors Bulletin, 33, 1-4.

- Cannon-Bowers, J.A., Salas, E. & Converse, S.A. (1993). Shared mental models in expert team decision making. In N.J. Castellan (Ed.), Individual and group decision-making (pp 221-246). Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Cohen, A.R. (1959). Situational structure, self-esteem, and threat-oriented reactions to power. In D. Cartwright (Ed.), Studies in social power. Ann Arbor, Michigan: Institute for Social Research.
- Cohen, S.G. (1994). Designing effective self-managing work teams. In M. Beyerlein (Ed.), Advances in Interdisciplinary Studies of Work Teams: Vol. 1 (pp. 67-102). Greenwich, CT: JAI Press.
- Cohen, S.G. & Bailey, D. (1997). What makes teams work: Group effectiveness research from the shop floor to the executive suite. Journal of Management, 23(3), 239-290.
- Daft, R. & Weick, K. (1984). Toward a model of organizations as interpretive systems. Academy of Management Review, 9, 43-66.
- Deming, W.E. (1986). Out of Crisis. Cambridge, MA: Center for Advanced Engineering Study, Massachusetts Institute of Technology.
- Donnellon, A. (1996). Team talk: Listening between the lines to improve team performance. Cambridge, Mass.: Harvard Business School Press.
- Dougherty, D. (1992). Interpretative barriers to successful product innovation in large firms. Organization Science, 3(2), 179-202.
- Fisher, K. (1993). Leading self-directed work teams: A guide to developing new team leadership skills. New York: McGraw Hill, Inc.
- Gabarro, J. (1990). The development of working relationships. In J. Galegher, R.E. Kraus, & C.Egido (Eds.), Intellectual teamwork: The social and technological bases of cooperative work. Hillsdale, NJ: Erlbaum, 79-110.
- Galbraith, J.R. (1994). Competing with flexible lateral organizations. Reading, Mass.: Addison-Wesley.
- Gladstein, D. (1984). A model of task group effectiveness. Administrative Science Quarterly, 29(4), 499-517.
- Glaser, B.G. & Strauss, A.L. (1967). The discovery of grounded theory. Hawthorne, N.Y.: Aldine.

- Gordon, J. (1992). Work teams: How far have they come? Training, (October), 59-65.
- Guzzo, R.A. & Dickson, M.W. (1996). Teams in organizations: Recent research on performance and effectiveness. Annual Review of Psychology, 47, 307-338.
- Hackman, J.R. (1987). The design of work teams. In J.W. Lorsch (Ed.), Handbook of Organizational Behavior (pp. 315-342). Englewood Cliffs, NJ: Prentice-Hall.
- Hackman, R.J. and Oldham. (1980). G.R. Work Redesign. Reading, Mass.: Addison-Wesley.
- Hambrick, D.C. (1983). Some tests of the effectiveness of functional attributes of Miles and Snow's strategic types. Academy of Management Journal, 26, 5-26.
- Henderson, J.C. & Lee, S. (1992). Managing I/S design teams: A control theories perspective. Management Science, 38(6), 757-777.
- Hofer, C.W. (1975). Toward a contingency theory of business strategy. Academy of Management Journal, 18, 748-810.
- Ishida, H. (1980). The effects of varied clarity of group goal and substeps upon group problem solving. Japanese Journal of Experimental Social Psychology, 19, 119- 125.
- Janz, B.D., Colquitt, J.A., & Noe, R.A. (1997). Knowledge worker team effectiveness: The role of autonomy, interdependence, team development, and contextual support variables. Personnel Psychology, 50, 877-904.
- Juran, J.M. (1989). Juran on leadership for quality. New York: Free Press.
- King, N., Rice, R.E., Majchrzak, A., Malhotra, A., & Ba, S. (1998). Computer-mediated inter-organizational knowledge sharing: insights from a virtual team innovating using a collaborative tool
Unpublished technical report. The University of Southern California.
- Katz, R. (1982). The effects of group longevity on project communication and performance. Administrative Science Quarterly, 27, 81-104.
- Katz, R. & Allen, T. (1985). Project performance and the locus of influence in the R & D matrix. Academy of Management Journal, 28, 67-87.

- Keller, R.T. (1986). Predictors of the performance of project groups in R & D organizations. Academy of Management Journal, 29, 715-726.
- Klimoski, R. & Mohammed, S. (1994). Team mental model: Construct or metaphor? Journal of Management, 20(2), 403-437.
- Latham, G.P. & Kinne, S.B. (1974). Improving job performance through training in goal-setting. Journal of Applied Psychology, 59, 187-191.
- Latham, G.P. & Lee, T.W. (1986). Goal setting. In E. A Locke (Ed.), Generalizing from laboratory to field settings. Lexington, Ma: Lexington Books.
- Latham, G.P. & Winters, D.W. (1989). Separating the cognitive and motivational effects of participation on performance. Graduate School of Business, University of Washington, unpublished manuscript.
- Latham, G.P. & Yukl, G.A. (1975). A review of research on the application of goal setting in organizations. Academy of Management Journal, 18, 824-845.
- Lawler, E.E.III (1998). Strategies for high performance organizations. San Francisco: Jossey Bass Publishers.
- Lawrence, P.R. & Lorsch, J.W. (1967). Organization and environment. Boston, Ma: Harvard Business School Press.
- Locke, E.A.(1976). The nature and causes of job satisfaction. In M.D. Dunnette (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally.
- Locke, E.A. & Latham, G.P. (1990). A theory of goal setting & task performance. Englewood Cliffs, N.J.: Prentice Hall.
- Locke, E.A., Shaw, K.M., Saari, L.M., & Lathan, G.P. (1981). Goal setting and task performance: 1969-1980. Psychological Bulletin, 90, 125-152.
- Manz, C. & Sims, H. (1989). Super-leadership: Leading others to lead themselves. New York: Prentice Hall.
- Mento, A.J., Steal, R.P. & Karren, R.J. (1987). A meta-analytic study of the effects of goal setting on task performance: 1966-1984. Organizational Behavior and Human Decision Processes, 39, 52-83.

- Miles, R. & Snow, C. (1978). Organizational strategy, structure and process. New York: McGraw-Hill.
- Mohrman, S.A. (1993). Integrating roles and structure in the lateral organization. In Galbraith, J.R., Lawler, E.E.III, & Associates (Eds.) Organizing for the future. San Francisco: Jossey-Bass, 109-141.
- Mohrman, S.A., Cohen, S.G., & Mohrman, A.M. (1995). Designing team-based organizations: New forms for knowledge work. San Francisco: Jossey Bass.
- Orasanu, J. (1990). Shared mental models and crew decision making (Technical Report No. 46). Princeton, N.J.: Princeton University, Cognitive Sciences Laboratory.
- Orasanu, J. & Salas, E. (1993). Team decision making in complex environments. In G.A. Klein, J. Orasanu, R. Calderwood & C.E. Zsombok (Eds.), Decision making in action: Models and methods (pp. 327-345). Norwood, N.J.: Aglex.
- Orlikowski, W.J. (1996). Improvising organizational transformation over time: A situated change perspective. Information Systems Research, 7(1), 63-92.
- Pava., C. (1983). Managing new office technology: An organizational strategy. New York: The Free Press.
- Peters, L.H., O'Chassie, M.B., Lindholm, H.R., O'Connor, E.J., & Kline, C.R. (1982). The joint influence of situational constraints and goal setting on performance and affective outcomes. Journal of Management, 8, 7-20.
- Porter, M.E. (1994). Competitive strategy revisited. In P. B. Duffy (Ed.), The relevance of a decade (pp. 243-286). Boston, Ma.: Harvard Business School Press.
- Simon, H.A. (1945). Administrative behavior. New York: The Free Press.
- Sundstrom, E., DeMeuse, K.P. & Futrell, D. (1990). Work teams: Applications and effectiveness. American Psychologist, 45(2), 120-133.
- Tenkasi, R., Mohrman, S.A., & Mohrman, A.M., Jr., (1998). Accelerating Organizational Learning During Transition. In Mohrman, S.A., Galbraith, J.R., Lawler, E.E., III, and Associates (Eds.),

- Tomorrow's organizations: Crafting winning capabilities in a dynamic world. San Francisco: Jossey-Bass, 330-361.
- Thompson, J.D. (1967) Organizations in action. New York: McGraw-Hill, 1967.
- Thompson, J.D. & Tuden, A. (1959) Strategies, structures, and processes of organizational decision. In J.D. Thompson and others (Eds.), Comparative studies in organization. Pittsburgh: University of Pittsburgh Press.
- Tubbs, M.E. (1986). Goal-setting: A meta-analytic examination of the empirical evidence. Journal of Applied Psychology, 71, 474-83.
- Wageman, R. (1997). Critical success factors for creating superb self-managing teams. Organizational Dynamics, 26(1), 49-62.
- Watson, C. (1983). Motivational effects of feedback and goal setting on group performance. Paper presented at the meeting of the American Psychological Association, Anaheim, California.
- Weick, K.E. & Roberts, K.H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. Administrative Science Quarterly, 38, 357-381.
- Wood, R.E., Mento, A.J., & Locke, E.A. (1987). Task complexity as a moderator of goal effects: A meta-analysis. Journal of Applied Psychology, 72, 416-425.
- Zeithaml, C.P. & Fry, L.W. (1984). Contextual and strategic differences among mature businesses in four dynamic performance situations. Academy of Management Journal, 27, 841-60.

Figure 1: The Impact of Direction-Setting on Knowledge Work Team Effectiveness

Organization Context

Effectiveness

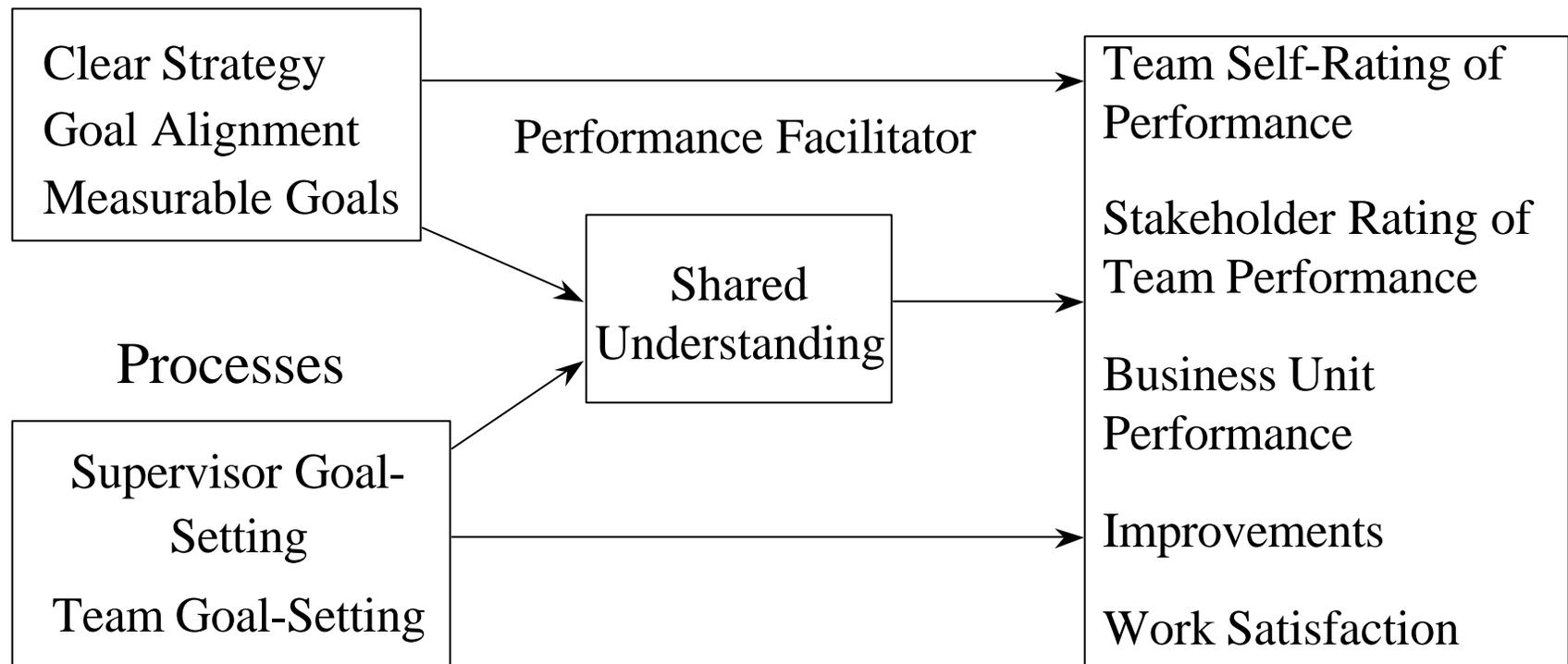


Table 1

Study Sample

Number of Team Members Sent a Survey	1673
Number of Team Members Responding	1065
Individual Response Rate	64%
Number of Stakeholders Sent Survey	948
Number of Stakeholders Responding	474
Stakeholder Response Rate	50%
Number of Teams Sent Survey	174
Number of Teams Responding	173
Team Response Rate	99%
Teams with Sufficient Data ¹	132
Response Rate of Teams with Sufficient Employee Data	76%
Number of Teams with Sufficient Stakeholder and Team Member Data	108
Response Rate of Teams with Sufficient Employee and Stakeholder Data	62%

¹ Teams were considered to have sufficient data if data were collected from at least 50% of team members, or, in the case of larger teams with 15 members or over, with at least a 33% response rate.

Table 2
Sample Characteristics

Gender	
Percentage of Men	78
Percentage of Women	22
Education	
Percentage with some College or Technical Training	16
Percentage College Graduates	41
Percentage with Graduate Education or Degree	39
Average Company Tenure in Years	13
Role in Company	
Percentage of Individual Contributors	67
Percentage Supervisor of Others	33
Percentage of First Level Supervisors	55
Percentage of Second Level Supervisors	31
Percentage of Third Level or Above	14
Average Number of Team Members	14
Percentage of Teams with Members from Multiple Disciplines	92
Average Number of Disciplines in Multi-Disciplinary Teams	5
Percentage of Team Members with Fulltime Team Assignments	32
Percentage of Time Spent on Work of Team for Partially Dedicated Members	46
Average Team Life Span in Months	18
Average Member Tenure on Teams in Months	14
Average Number of Meetings Per Month	3.5
Average Length of Meetings in Hours	2
Percentage of Members Describing Membership as Stable	30
Percentage of Members Describing Membership as Changing from Time to Time	64
Percentage of Members Describing Membership as Always Shifting	6
Percentage of Teams with Co-Located Members	45
Percentage of Members Describing Team as Reporting to One Manager	46
Percentage of Members Describing Team as Reporting to a Team of Managers	27
Percentage of Members Describing Team as Reporting to Different Managers	27
Percentage of Members Saying No One is Leader of the Team	6
Percentage of Members Saying One of the Members is the Leader	64
Percentage of Members Saying Manager at Higher Level is the Leader	30

TABLE 3
Means, Standard Deviations, Intercorrelations, and Reliabilities

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 Strategy	3.62	.70	(.83)										
2 Goal Alignment	3.96	.41	.59***	(.72)									
3 Goals Measurable	4.77	.74	.32**	.29**	(.75)								
4 Sup'vr	5.01	.69	.25**	.34***	.21*	(.86)							
5 Team Goal-Setting	4.91	.63	.55***	.61***	.55***	.36***	(.84)						
6 Shared Goal-Setting	4.43	.60	.52***	.42***	.50***	.38***	.70***	(.79)					
7 Self-Rating Understanding	65.58	15.73	.57***	.44***	.32**	.31**	.41***	.50***	(.96)				
8 Stakeholder Team Perform	68.83	16.20	.37***	.06	.21*	.24*	.23*	.37***	.63***	(.94)			
9 Business Unit Team Perform	63.74	12.64	.62***	.55***	.44***	.28**	.44***	.44***	.71***	.37***	(.95)		
10 Improve Perform	1.99	.24	.31**	.41***	.38***	.27**	.59***	.43***	.12	-.01	.24*	(.84)	
11 Satisfaction	5.43	.58	.40***	.51***	.29***	.51***	.39***	.36***	.21*	.04	.32**	.52***	(.91)

Notes: a) All values except for reliabilities are based on team level N of 108.

b) Reliabilities based on individual level N of 1065.

c) * p < .05, ** p < .01, *** p < .001

Table 4
Impact of Predictors on Performance Outcomes
(Regression Results)

Predictors	Performance Facilitator	Effectiveness Outcomes				
		Self-Rating Team Performance	Stakeholder Rating - Team Performance	Unit Results	Improvements	Satisfaction
Shared Understanding (A)		.28*	.26*	.08	.01	.03
Clear Strategy (1a -1b)	.21*	.40***	.40**	.42***	-.08	.11
Goal Alignment (2a -2b)	-.11	.13	-.29*	.28**	.11	.33**
Measurable Goals (3a-3b)	.14t	.09	.06	.27**	.08	.11
Supervisor Goal-Setting (4a -4b)	.15*	.10	.16	.06	.06	.37***
Team Goal-Setting (5a - 5b)	.53***	-.17	-.08	-.19	.49***	-.09
	Adj R2=.53 F=25.55***	Adj R2=.38 F=11.66***	Adj R2=.21 F=5.56***	Adj R2=.47 F=16.90**	Adj R2=.33 F=9.65***	Adj R2=.37 F=11.52***

Note:

- a) Numbers in boxes are beta weights for regression models
b) N = 108
c) When the outcome regressions are done in a stepwise fashion with the five predictor variables entered in the first step and Shared Understanding added in the second, the changes in R2 due to the addition of Shared Understanding and their levels of significance for regressions on each of the dependent variables are as follows:
For Self-Rating of Team Performance, change in R2=+.034 (F=5.79*)
For Stakeholder Rating of Team Performance, change in R2=+.029 (F=3.80*)
For Unit Results, change in R2=.003 (F=.585ns)
For Improvements, change in R2=.000 *F=.013ns)
For Satisfaction, change in R2=.000 (F=.057ns)
- c) t p<.10, * p<.05, ** p<.01, *** p<.001