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This paper tests a theoretically-driven model of self-managing work team effectiveness. Self-managing work team effectiveness is defined as both high performance and employee quality of work life. Drawing on different theoretical perspectives including work design, self-leadership, socio-technical, and participative management, four categories of variables are theorized to predict self-managing work team effectiveness: group task design, encouraging supervisor behaviors, group characteristics, and employee involvement context. Data is collected from both a set of self-managing and traditionally managed teams from a large telephone company, and the model is tested with structural equations modeling. Support is found for hypotheses concerning group task design, group characteristics, and employee involvement context, but not encouraging supervisory behaviors.

Key Words: Self-managing work teams, team effectiveness, service sector, work design, employee involvement, supervisory behavior

The use of self-managing work teams has increased in response to competitive challenges. In 1990, 47% of the Fortune 1000 companies reported using self-managing work teams with at least some employees, compared to 28% in 1987. Companies report that they use employee involvement practices such as self-managing work teams to improve productivity, quality, and morale, and to reduce costs (Lawler, Mohrman, & Ledford, 1992).

Although empirical research has been limited, there is a growing body of evidence that the use of self-managing teams contributes to various dimensions of performance effectiveness, such as productivity improvement (Guzzo, Jette, & Katzell, 1985; Beekun, 1989), cost savings (Wall, Kemp, Jackson, & Clegg, 1986), manager and self-ratings of performance effectiveness (Cohen & Ledford, 1994), and employee satisfaction (Cohen & Ledford, 1994; Corderey, Mueller, & Smith, 1991; Wall et al., 1986). In their review of the empirical literature of self-managing team effectiveness, Goodman, Devadas, and Hughson (1988) concluded that self-managing work teams have a modest impact on performance and the attitudes of team members, but changes are limited to the direct targets of the intervention.

Self-managing work teams are groups of interdependent individuals that can self-regulate their behavior on relatively whole tasks (Cummings & Griggs, 1977; Goodman et al., 1988). Key characteristics include: (a) employees with interdependent tasks who are responsible for making a product or providing a service; and (b) employee discretion over decisions such as work assignments, work methods and scheduling of activities (Goodman et al., 1988). Generally, the members of self-managing work teams have a variety of skills needed to perform the task, and the team receives performance feedback (Wall et al., 1986). Self-managing teams may or may not have direct supervisors.

Researchers have advanced a number of theoretical explanations of self-managing work team effectiveness. Theories have tended to emphasize a single category of predictor variables. For example, both socio-technical theory (e.g. Pasmore, 1988; Pearce & Ravlin, 1987) and work design theory (Hackman & Oldham, 1976) have focused on the design of the group's task. Self-leadership theory (Manz & Sims, 1986; 1987) has identified the supervisory behaviors that help self-managing work teams achieve success. Theories of participative management (e.g. Lawler, 1986; 1992) have identified the aspects of the organizational context that contribute to the effectiveness of self-managing teams. An

integrative framework that connects these research perspectives and tests a comprehensive model of self-managing work team effectiveness has been lacking.

Several theorists have proposed general models of group effectiveness that apply to all groups, not just self-managing work teams. These models typically include multiple categories of predictors. Predictors used overlap considerably from one model to another, and include work design, group characteristics, organizational context, and group processes (e.g., Gladstein, 1984; Hackman, 1987; Guzzo & Shea, 1980; Sundstrom, DeMeuse, & Futrell, 1990). Although there have not been many empirical tests of these group effectiveness models, the results from the few empirical tests are suggestive. Gladstein (1984) found that the variables in her model accounted for team satisfaction and self-reported effectiveness, but not for sales performance. Campion, Medsker and Higgs (1993) found that nearly all characteristics predicted some effectiveness criteria, but job design and group process variables were more predictive than interdependence, composition, and organizational context variables.

Some theorists specify that their general group effectiveness models are applicable to self-managing work teams (Cummings, 1981; Hackman, 1986). From this perspective, the same characteristics that determine group effectiveness will determine self-managing work team effectiveness, because they are simply one type of group. Others have argued for more fine-grained models of group effectiveness taking into consideration differences in technology and organizational arrangements (Goodman, Ravlin, & Schminke, 1987; Cohen & Ledford, 1994). From this perspective, a predictive model of self-managing work team effectiveness may differ from a generic group effectiveness model, because self-managing work teams may require a different combination of attributes. Cohen (1994) has proposed a model of self-managing work team effectiveness that draws from the group effectiveness models, but is specifically focused on identifying predictor variables for self-managing work team effectiveness. There are, however, no empirical studies that help resolve the question of whether the variables predicting the effectiveness of self-managing work team and other types of groups are different.

Existing research and theories, then, have several key limitations. Theories of self-managing work team effectiveness tend to be limited to a few predictors. Researchers have made few attempts to integrate different perspectives. Moreover, since no prior research tests competing theories

simultaneously, it is impossible to know which theoretical explanations are more powerful. Theories of work group effectiveness tend to be broader in the range of predictors incorporated into the models, but there is virtually no research on their applicability to self-managing work teams. Finally, research on all types of work groups tends to use only one or two outcome measures, which may be misleading if different predictors are related to different outcomes.

The present study attempts to address these deficiencies. It tests a relatively comprehensive model of self-managing work team effectiveness. This permits us to examine a number of different predictors simultaneously, in order to test competing explanations for self-managing team effectiveness. We also examine a comparison sample of traditionally managed teams to determine whether the same predictors are relevant to both types of groups. Finally, we use multiple operationalizations of effectiveness.

DETERMINANTS OF SELF-MANAGING WORK TEAM EFFECTIVENESS

Self-managing work team effectiveness is defined in terms of performance effectiveness (e.g. controlling costs, improving productivity and quality), employee attitudes about their quality of work life (e.g. job satisfaction, organization commitment), and employee behavior (absenteeism). These criteria are derived from group effectiveness theories, socio-technical theory, and the empirical work on quality of work life and self-managing work team effectiveness (Cohen, 1994). Predictive variables can be differentially tested on each outcome criterion as a result of having multiple outcome criteria (Cohen & Ledford, 1994).

This model of self-managing work team effectiveness has four categories of predictor variables. They are group task design, group characteristics, encouraging supervisory behaviors, and an organizational context that supports employee involvement. Each of these categories of variables reflects a theoretical perspective, and testing the model enables comparisons to be made among these theoretical perspectives.

Insert Figure 1 About Here

Group Task Design

Both work design (Hackman & Lawler, 1971; Hackman & Oldham, 1976; Hackman & Oldham, 1980; Turner & Lawrence, 1965) and socio-technical theory (Cummings, 1978; Pasmore, 1988; Pearce & Ravlin, 1987) point to task design as contributing to self-managing team effectiveness. Work design theory and socio-technical theory posit different causal explanations for why group task attributes influence self-managing team effectiveness, but both advocate the same group task attributes. First, we will present each group task attribute, then provide the job characteristics and socio-technical explanations respectively for why each contributes to self-managing team effectiveness.

The group task attributes are:

(1) *Group task variety* motivates by allowing group members to learn and use different skills thereby reducing boredom and monotony (Hackman & Oldham 1976; Hackman, 1987) and builds flexibility by enabling members to substitute for one another (Susman, 1976).

(2) *Group task identity* motivates by encouraging a sense of collective responsibility for completing a whole piece of work (Hackman & Oldham, 1976; Hackman, 1987). It helps the group to self-regulate its activities by allowing members to control technical variances within group boundaries (Cummings, 1978).

(3) *Group task significance* motivates group members by enabling them to care about the important work they perform (Hackman & Oldham, 1976; Hackman, 1987). Group members also are more likely to cooperate with one another when they perceive the work that they do as significant (Cummings, 1978).

(4) *Group task autonomy* increases ownership and a sense of responsibility, which motivates effective performance (Hackman & Oldham, 1976; Hackman 1987). Autonomy also enables group members to effectively deal with task and environmental demands by making decisions in the process of doing the work. This self-regulatory capacity is hypothesized to be effective because group members can allocate resources efficiently to deal with the total variation in work conditions (Susman, 1976; Cummings, 1978).

(5) *Group task feedback* provides knowledge of the results of work activities, which builds internal work motivation (Hackman & Oldham, 1976; Hackman, 1987). Task feedback enables group members to monitor their activities and make improvements in response to performance situations (Pasmore, 1988).

In general, group task attributes are viewed as contributing to self-managing work team and to group effectiveness as a result of their impact on motivation according to work design theory and their impact on self-regulation according to socio-technical theory. Because these theories overlap in their recommendations for group work design, several theorists have argued for their integration (Cummings, 1978; Denison, 1982, Rousseau, 1977; Wall et al., 1986), as we do. Thus, the following hypotheses can be derived:

Hypothesis 1a: Group task attributes will be positively related to self-managing work team effectiveness.

1b. Group task attributes will be positively related to traditionally managed group effectiveness.

Encouraging Supervisory Behaviors

The second category is derived from Manz and Sims' (1986; 1987) theory and research on self-leadership in self-managing work teams. Manz and Sims (1986) describe leadership in self-managing work teams as a paradox. How does one lead teams of employees who are supposed to manage themselves? They deal with this paradox by identifying six behaviors that a leader should perform in order to help a self-managing work team to manage itself (Manz & Sims, 1987). The six leadership behaviors are:

(1) *Encourage self-observation/self-evaluation* so that the team can gather the information required to monitor and evaluate its performance.

(2) *Encourage self-goal setting* so that the team sets performance goals.

(3) *Encourage self-reinforcement* so that the team recognizes and reinforces good team performance.

(4) *Encourage self-criticism* so that the team is self-critical and discourages poor team performance.

(5) *Encourage self-expectation* so that the team has high expectations for group performance.

(6) *Encourage rehearsal* so that the team practices an activity before performing it.

The theoretical foundation of Manz and Sims' work is Bandura's social learning theory (Manz, 1986). Social learning theory views human behavior as reciprocally determined by environmental contingencies

and internal cognitive evaluations. Employees develop their own performance standards, conduct self-evaluations, and self-regulate their behavior at work. These activities are the essence of self-management (Mills, 1983). A supervisor's role in a self-managing work team is to help employees to generate self-controls (Manz, 1986). Self-leadership is expected to have a direct impact on performance effectiveness, because team members will learn how to perform those behaviors that improve performance. As in socio-technical theory, Manz and Sims' (1987) self-leadership theory identifies self-regulation as the key mechanism underlying self-management.

Little empirical work has been done to validate Manz and Sims' (1987) theory. In their original study, they identified these six self-leadership behaviors and found that they were significantly correlated with team member and internal team leader evaluations of supervisor effectiveness. They did not assess the impact of these behaviors on self-managing work team performance, employee satisfaction, or withdrawal behaviors. We hypothesize that encouraging supervisory behaviors will facilitate these outcomes.

Hypothesis 2a: Encouraging supervisory behaviors will be positively related to self-managing work team effectiveness.

2b. Encouraging supervisory behaviors will be positively related to traditionally managed group effectiveness.

Group Characteristics: Composition, Beliefs, and Process

The third category consists of the subcategories of group composition, group beliefs and group processes. The variables chosen are derived from models of group effectiveness (Cummings, 1981; Guzzo et al, 1993; Hackman, 1987; Gladstein, 1984; Kolodny & Kiggundu, 1980; Sundstrom, et al., 1990).

Group composition. Almost all models of group effectiveness contain variables related to group composition. For example, Hackman's (1987) model consists of group size, members' technical and interpersonal skills, and a balance between homogeneity and heterogeneity in the mix of members. Gladstein's (1984) model measures group composition in terms of adequate skills, heterogeneity, organizational tenure, and job tenure. Kolodny and Kiggundu (1980) include task skills in their group effectiveness model influenced by socio-technical theory. These models share an emphasis on composing

teams with the mix of members who have needed expertise. Guzzo and Shea (1992) include stability of membership as a composition variable. Evidence about the impact of group composition on work team effectiveness is limited and mixed (Guzzo and Shea, 1992). To our knowledge, no studies have examined the impact of composition on self-managing work team effectiveness.

The composition variables in our model are:

(1) Group expertise is the right mix of people with task-relevant knowledge and skills (Cummings, 1981; Hackman, 1986), which clearly should contribute to self-managing work team effectiveness.

(2) Group s*ize adequacy* is having the appropriate number of members to do the task well. The group's size should be the smallest number needed, because additional people are expected to result in higher coordination costs and process losses (Steiner, 1972; Hackman, 1987).

(3) *Group stability* is the continuity of group membership. If members turn over frequently, considerable time is lost orienting new members to technical requirements and the way that the group works together. The lost time may interfere with effective self-managing work team performance.

Group beliefs. These are shared beliefs by group members about a group. Our model includes group norms and group self-efficacy or potency, both derived from group effectiveness theories (Hackman, 1987; Guzzo et al., 1993).

(1) G*roup norms* are standards shared by group members which regulate group member behavior (Steers, 1981). A norm is well crystallized when there is a high degree of agreement among group members about the amount of approval or disapproval associated with particular behaviors (Jackson, 1965). Crystallization does not indicate the content of a norm (e.g., groups can have norms to restrict output as well as norms for continuous improvement), but without crystallization of norms a group will not be able to regulate member behavior (Cohen, 1994). Consequently, self-managing work teams are likely to have better crystallized norms than other groups, so that they can regulate member behavior. Very few studies exist about the relationship of group norms to self-managing work team effectiveness. Goodman (1979) traced the development of group norms in his study of self-managing coal mining teams and found that norms did appear, but they were not related to performance. We are including the crystallization of group norms as an exploratory variable.

(2) *Group self-efficacy* or potency is the shared belief among members that a group can be effective (Bandura, 1982; Guzzo, et al, 1993). Shea and Guzzo (1987) include group potency in their model of group effectiveness and assert that group potency influences performance and in return is influenced by it. Some evidence suggests that group potency is related to self-managing work team effectiveness (Cohen & Denison, 1990; Larson & Lafasto, 1989).

Group process. This refers to how members interact as they do their work. McGrath (1965) introduced an input-process-output model that influenced the group effectiveness theories of Hackman (1987) and Gladstein (1984). We derived our process variables from Hackman's model (1987), but similar variables can be found in several models of group effectiveness (Cummings, 1981; Gladstein, 1984; Sundstrom, et al., 1990).

(1) *Group coordination* involves group members working together without duplicating or wasting efforts and doing so with team spirit and energy. Self-management depends upon effective coordination and team spirit can be contagious and foster a "can do" attitude that may foster effective performance.

(2) *Group innovation processes* are the group activities designed to invent and implement new and better ways of doing their tasks. Self-managing work team effectiveness may depend upon the group's ability to innovate and come up with new solutions that address changing task demands.

Our hypotheses are:

Hypothesis 3a: Group characteristics will be positively related to self-managing work team effectiveness.

3b. Group characteristics will be positively related to traditionally managed group effectiveness.

Employee Involvement Context

The final category of predictor variables in our model of self-managing work team effectiveness is an organizational context that supports employee involvement. It is adapted from Lawler (1986, 1992), who asserts that several organizational design elements must be moved to lower organizational levels for employee involvement to be effective. The first four design elements are explicit (e.g., Lawler, 1986: 42-

43), while the fifth is implicit in his discussions of self-managing work teams and other participative practices (e.g., Lawler, 1992: 88-91). The design elements are:

(1) The *power* to make decisions about work and business performance.

(2) *Information* about work processes, quality, customers, business performance, competitors and organizational changes.

(3) *Rewards* tied to performance and development of capability.

(4) *Training* that enables employees to develop the knowledge required for effective performance.

(5) The *resources*, that is, the equipment, space, tools, and materials that permit employees to accomplish their work.

Lawler's (1986, 1992) principles of employee involvement design are derived from motivation theory (e.g., Lawler, 1973) and systems theories that emphasize the importance of the internal congruence of organizational design elements (e.g., Galbraith, 1977). He indicates that the more each of the elements is moved down in the organization, the more employees will feel ownership and responsibility for their work, motivating enhanced performance. Each design element reinforces the others. Lawler's concept of employee involvement encompasses but is much broader than participation as it is defined in most contemporary theory and research. Researchers typically define employee participation as a process of influence sharing between supervisor and subordinate (e.g., Locke & Schweiger, 1979; Wagner, 1994). Lawler's concept is closer in spirit to older definitions of participative systems (e.g., Likert, 1961; McGregor, 1960). No rigorous work has been done examining the relationship between employee involvement as defined by Lawler and performance, satisfaction, and withdrawal behaviors. However, considerable research indicates that even narrower forms of participation are related to modest performance improvements (Miller & Monge, 1986; Wagner, 1994).

Although employee involvement variables were derived from Lawler (1986, 1992), group effectiveness theory also suggests their importance. Hackman (1987) includes supportive reward, training, information, and resource allocation systems in his group effectiveness model. Shea and Guzzo (1987) discuss the importance of a reward system that supports team performance. Gladstein (1984) includes resources, training and consultation, and rewards in her model. In her later work, she argues strongly for

an external perspective on team effectiveness (Ancona & Caldwell, 1992). Thus, the importance of contextual variables is accepted by group theorists.

Hypothesis 4a: A supportive employee involvement context will be positively related to self-managing team effectiveness.

4b. A supportive employee involvement context will be positively related to traditionally managed group effectiveness.

METHODS

Sample

The present study draws on data collected for a large-scale study of work teams in a large U.S. telephone company. The company had implemented work teams in many of its functions over several years. To provide guidance for the study the company established a research team which consisted of 10 middle managers from different functional and geographic areas of the company and four union representatives. Two of this study's authors met with the research team six times over a nine month period. The research team provided guidance on the scope of the study, the selection of the sample, research design, and questionnaire items. It helped with the logistics of administering and collecting over 1300 questionnaires and helped to disseminate study results.

We worked to ensure that a diverse sample of teams was selected for inclusion in the study with approximately equal numbers of self-managing work teams and traditional teams. We began by selecting self-managing work teams. The company research team was provided with the following definition:

> Self-managing work teams are groups of interdependent members organized around a particular customer service or equivalent responsibility, which are characterized by high levels of employee involvement in decisions such as task assignments and methods for carrying out the work. Self-managing work teams are responsible for regulating their performance by setting their own goals and objectives, obtaining performance feedback, and making necessary corrections.

After the company research team identified the self-managing work teams, we selected traditionally managed work teams comparable in terms of the type of work the employees performed, by reviewing

organizational charts and confirming our choices with research team members. Employees from these two types of teams were comparable in terms of their demographic backgrounds.

When the selection process was complete, the research team had identified 85 self-managing work teams and 84 traditional teams that performed the following functions: (1) technical service to internal and external customer); (2) small business and residential customer service which included recommending products and services, inputting customer orders, and resolving customer problems; (3) clerical support to engineers and other technical personnel, and (4) management of engineers and other technical personnel.

Research Procedures

Data for this study were primarily obtained through questionnaire responses from employees, although interviews were conducted with the members of three self-managing work teams--an installation crew, a small business office team, and an engineering clerical team -- to help us better understand the nature of the work performed within the teams. Questionnaires were distributed to each team member and that team's division or district manager. All respondents were asked to write down on their survey the code number for their work team or the one they managed. If managers had more than one team reporting to them, they completed a separate questionnaire for each team. The team code number enabled us to maintain the anonymity of the individual respondent, yet permitted us to match a particular respondent to a given team. Data from employees and managers could then be aggregated to the team level.

We obtained data from 1044 employees from 138 teams, 69 self-managing and 69 traditionally managed, which was a team response rate of 82%. We also obtained data from 139 managers who provided assessments of 129 teams, 61 self-managing and 67 traditionally managed teams, a team response rate of 76%.

Teams were then dropped from the original sample in order to ensure data of sufficient quality. First, if a team had fewer than two people that responded to the survey, it was excluded from the sample. Using a questionnaire item that asked people how many members were in the group, we compared the number of respondents to the average reported size of each group. The sample that remained had a ratio of .70 of the number of respondents in each group to its average reported size. Second, we used the

consistency of members' questionnaire responses regarding team size to ensure that respondents had the same team in mind when responding to the questionnaire. In field research, most employees are members of nested teams. For example, respondents from the same repair crew may respond about their repair crew, the department that includes their crew, or their garage which includes several departments. We dropped cases from the analyses if the respondents reported a group size that was two standard deviations above or below the mean. After dropping teams, the remainder had a median size of ten members, and no team had less than 3 members. Third, employees were given our definition of self-managing work teams in the questionnaires and asked if their group fit their definition. When there was a conflict between objective classifications by research team members and subjective classifications by team members, we used subjective classifications. We removed groups from our sample if less than 75% of respondents agreed on its status as self-managing or not, regardless of how it was classified. Finally, after deleting some cases due to missing data on the dependent variables, our final sample contained data from 120 teams, 51 self-managing and 69 traditionally managed, for a team response rate of 71% .

Employees were 48% female and 52% male. Average age was 39 years (SD=7.1). Average tenure in the company was 15 years (SD=6.8), with just 11% of employees having a tenure of 10 years or less. 62% of employees had some college education or technical training, with 15% having either a college degree or some graduate school, and 22% being high school graduates. Employees had been working in their current job an average of 8.3 years (SD=5.8) and had been in their current work group an average of 4 years.

Measures

The categories of variables that we measure on the surveys are perceived work team effectiveness (as rated by team members and by the team's district or division manager), employee quality of work life, group work design, encouraging supervisory behaviors, group characteristics and employee involvement context. Survey items were measured on a Likert-type scale. Absenteeism was measured using company archival sources.

Dependent variables. Two measures of perceived *work team effectiveness* were collected. Perceived work team effectiveness was obtained by having the team members rate team performance on

quality, productivity, costs, and safety. Based on a confirmatory factor analysis supporting a one factor solution and a high reliability score (α=.82), these four items were aggregated into one work team effectiveness score. The district or division manager of the team rated the teams in the sample on quality, efficiency, and overall performance against all other teams in the organization that performed similar work. Because these three items loaded on a single factor and internal consistency was high (α=.97) they were aggregated into one overall measure of managerial perception of team performance. The instructions on the questionnaire encouraged these managers to check performance records before rating the groups, and they were asked to indicate on the questionnaire the source of data they employed in determining their rating. Thus, although we measured managers' perceptions of performance, we tried to ensure that their ratings were anchored.

Quality of work life was measured by job satisfaction (2 items, α=.91), growth needs satisfaction (4 items, α=.89), social needs satisfaction (3 items, α=.81), group satisfaction (3 items, α=.91), organizational commitment (5 items, α=.84), and trust (2 items, α=.82). The first three satisfaction measures were based on the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). The measure of group satisfaction was drawn from Hackman's (1982) Group Effectiveness Questionnaire. The measure of organizational commitment was drawn from the short version of Mowday and Steers' commitment scale (1979), and the trust measure was developed for use in this study. A confirmatory factor analysis of the QWL scales supported a three factor solution (i.e., overall satisfaction, commitment, and trust). Thus, the items from the four satisfaction measures (i.e., job, growth needs, social needs, and group) were combined into a single overall satisfaction score (12 items, α=.90).

In general, we were not able to obtain company performance data that were both aggregated at the team level and comparable across different types of teams. An exception was *absenteeism*, measured as dollars lost due to short-term absence over an eight-month period. Higher numbers indicated more dollars lost. The company did not identify individual employees on their absenteeism tracking forms, but instead reported incidents by work team code numbers. Thus, we aggregated this data to the team level for teams in our sample.

Independent variables. *Group task design* was assessed using items from Hackman and Oldham's (1980) job characteristics questionnaire. The theory posits five dimensions of work design: variety (3 items, α=.92), autonomy (3 items, α=.90), feedback (3 items, α=.90), identity (2 items, α=.88), and significance (2 items, α=.82). Based on the results of a confirmatory factor analysis of the job design scales, job significance was dropped from further analyses due to poor loadings.

Encouraging supervisory behavior was assessed using Manz and Sims' (1987) Self-Management Leadership Questionnaire. Based on the results of a confirmatory factor analysis supporting 3 factors, these items were used to create three scales: encouraging self-criticism (4 items, α=.95), encouraging self-rehearsal (4 items, α=.93) and encouraging self-management (13 items, α=.98). One item was dropped due to cross-loading.

Group characteristics measures, made up of the subcategories of group composition, group beliefs, and group process, were derived from research on group effectiveness. For the group composition variables, we adapted Hackman's (1987) measure of expertise (3 items, α=.84) and size adequacy (2 items, α=.61), and developed our own measure of group stability of membership (2 items, α=.79). For the group belief variables, we adapted Hackman's (1987) measure of group norms (2 items, α=.88) and developed our own measure of group self-efficacy (4 items, α=.88). For the group process variables, we adapted Hackman's measures of group coordination (3 items, α=.84) and group innovation (2 items, α=.83). Size was deleted from further analysis due to its low reliability. Based on the results of a confirmatory factor analysis of the group characteristics scales, we dropped group self-efficacy due to poor loadings.

Employee involvement context measures were developed from Lawler's (1986) theory of involvement. Five components of an employee involvement context were created: power (6 items, α=.95), information (6 items, α=.83), management recognition (a measure of rewards, 2 items, α=.81), training (3 items, α=.93), and resources (2 items, α=.83). A confirmatory factor analysis of the employee involvement context scales supports a four factor solution where training and resources load on to a single factor. Consequently, the training and resource items were aggregated into a single scale (5 items, α=.88).

Table 1 presents the means, standard deviations, reliabilities, and intercorrelations of these scales.

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Analytical Procedures

In past work using LISREL, researchers who are attempting to model relationships among a large number of latent variables have found it difficult to fit such models even to predictions with strong theoretical support (Niehoff & Moorman, 1993). The relatively small number of cases for estimating such a complex model exacerbates this problem because LISREL requires approximately five cases for each free parameter in the model (Bagozzi & Yi, 1988). Therefore, steps are needed that decrease the number of measures in the model (Joreskog & Sorbom, 1989). Following the recommendation of Niehoff and Moorman (1993), we first employed confirmatory factor analysis (CFA) to assess the validity of the measurement model of the independent variables. Then given adequate validity of those measures, we reduced the number of indicators in the model by creating an index representing each of the latent variables. For example, a group characteristics index was created from its five indicators in the measurement model. Then, these index measures were input into the structural equations modeling for examining the hypotheses. This process allowed us to simplify the complex theoretical model and reduce the number of latent variables in order that a LISREL structural model could be estimated. Creating an index for each latent variable also was important given the multicollinearity among the manifest measures, particularly among those manifest measures which compose a given latent variable. Campion et al. (1994) analyzed a similar set of variables at the manifest level, but interpretation of relationships with the dependent variables was difficult due to bias from multicollinearity.

Confirmatory factor analysis. CFA was used to examine the convergent and discriminant validity of the measurement model of the independent variables. Each of the four theoretical perspectives (i.e., group work design, encouraging supervisory behaviors, group characteristics, and employee involvement context) was modeled as a latent variable measured by multiple indicators, or manifest variables (e.g., expertise, stability, norms, coordination, and innovation in the case of group characteristics). Each manifest variable was permitted to load on one latent variable. Because of the multicollinearity among the

manifest variables, unweighted least squares (ULS) is used to estimate the measurement model (as recommended by James & James, 1989). Traditional maximum likelihood (ML) is also used to estimate the model. To maximize the size of the dataset for estimating the measurement model, cases with complete data on all of the independent variables were included in the CFA.

It is not necessary to assess the validity of the measurement model of the dependent variables because we employed one scale to measure each dependent variable. The exception was QWL, for which we had three scales: overall satisfaction, commitment, and trust. A CFA of those three QWL measures provided loadings which were used as weights in creating an index measure of QWL. This index measure of QWL is then used in the structural analysis described below.

Structural equations modeling. Due to the limited sample size, the index of each latent variable, rather than the multiple indicators included in the measurement model, is used in the structural equations modeling. Because we hypothesize that each independent variable is related to each dependent variable, our structural model is saturated (Joreskog & Sorbom, 1989). In a saturated model, the significance of the individual paths can be determined, but the overall fit of the model to the data cannot be assessed because no overall fit statistics are estimated. Consequently, we are able to test each of our hypotheses but not the overall structural model. We estimate the structural model on the self-managing and the traditionally managed team samples in order to assess the different determinants of self-managing team effectiveness and traditional team effectiveness.

RESULTS

Confirmatory Factor Analyses

Both the ML and ULS solutions are provided in Table 2. One manifest variable, self-criticism, a dimension of encouraging supervisory behavior, was dropped from the analysis due to strong correlated error variance with other variables. Task feedback, a measure of group work design, loaded on the employee involvement latent variable. This suggests that respondents interpreted feedback as communications from agents rather than from the task. Power, a measure of employee involvement, loaded on the group work design latent variable. This probably results from the conceptual overlap

between the meaning of power in the employee involvement context and autonomy in the group work design framework. The final measurement model is shown in Figure 2.

INSERT TABLE 2 & FIGURE 2 ABOUT HERE

The goodness of fit indices for the ULS solution indicated that the fit of the model to the data was generally good. Both the GFI and AGFI exceeded .97, and the RMSR approached the .05 rule of thumb. The chi-square cannot be used to test the goodness of fit for ULS estimations (James & James, 1989). The ML solution, however, suggests some minor model misspecifications: the GFI is .88, the AGFI is .82, and the RMSR is .07. Model misspecification may be due to a number of reasons including the substantial multicollinearity among manifest variables leading to correlated error variance or the low ratio between cases and paths to be estimated (in this case 3.5:1 rather than the ideal 5:1 scenario (Bagozzi & Yi, 1988)).

In cases such as this with minor model misspecification, the noncentralized normed fit index (NCNFI) can be computed to obtain an assessment of comparative fit among nested models. When comparing two models, a large change in chi-square compared to the difference in degrees of freedom indicates that the freed parameters constitute a real improvement in fit. An index greater than or equal to .90 indicates an adequate fit. Here the null solution is contrasted to a one factor model (where all independent variables are hypothesized to load on one latent variable), a three factor model (where group job design and employee involvement context are hypothesized to be one latent variable), and the four factor measurement model hypothesized in this paper. The results suggest that only the four factor model achieves an adequate NCNFI (see Table 3).

INSERT TABLE 3 ABOUT HERE

Structural Equations Modeling

As described above, to reduce the number of free parameters of the structural equations modeling, an index is created for each of the latent variables. To take into account the differential loadings of the manifest variables on the latent variables as shown in Table 2, each index is created from the mean of the

manifest variables using their ULS loadings as weights. For example, to create the group job design index, autonomy is weighted by .90, identity by .68, variety by .63, and power by .93.

Descriptive statistics and correlations for all of the variables included in the structural equations modeling are provided in Table 4 for both the self-managing work team and traditionally managed samples. First, we discuss the structural equation results for self-managing teams, followed by those for traditional groups.

Figure 3 displays results of hypotheses testing using structural equations modeling on the separate sample of self-managing work teams. Standardized path estimates are provided to facilitate comparison of coefficients. Three out of four hypotheses are supported by this data, for at least some dimensions of effectiveness. Group task design is positively related to the team rating of performance (.35), supporting Hypothesis 1a. Encouraging supervisory behavior is negatively related to manager rating of performance (-.35), which is in the opposite direction predicted by Hypothesis 2a. Group characteristics are positively related to team rating of performance (.43) and less absenteeism dollars lost (-.28), supporting Hypothesis 3a. Finally, employee involvement context is positively related to QWL (.65) and manager rating of performance (.64), supporting Hypothesis 4a. Among the dependent variables, QWL is positively related to team ratings of performance (.31). Team performance ratings are positively related to manager rating of performance (.40) and reduced absenteeism (-.38). Manager rating of performance is related to more dollars lost due to absenteeism (.39). No other paths are significant.

INSERT TABLE 4 & FIGURE 3 ABOUT HERE

The structural equation results for the traditionally managed groups have some overlap (and some differences) from those of the self-managing work teams, illustrated in Figure 3. Group task design is found to be positively related to QWL (.38) and related to fewer dollars lost due to absenteeism (-.61), supporting Hypothesis 1b. Encouraging supervisory behavior is not related to any of the dependent variables, providing no support for Hypothesis 2b. Group characteristics are positively related to QWL (.21) providing support for Hypothesis 3b. Employee involvement context is positively related to QWL (.35), providing support for Hypothesis 4b. Again, three out of four hypotheses are supported for at least

some dimensions of effectiveness. In terms of relationships among the dependent variables, QWL is positively related to team rating of performance (.51) and team rating of performance is positively related to manager rating of performance (.33). No other paths are significant.

In general, group characteristics, group work design, and a supportive employee involvement context are positively related to effectiveness criteria in both types of groups, while encouraging supervisory behaviors are not. Group task design is positively related to team rating of performance for the self-managing work team sample, but is related to QWL and to fewer dollars lost to absenteeism for the traditional sample. Encouraging supervisory behaviors are negatively related to manager ratings of performance for the self-managing work team sample, but are unrelated to any outcome for the traditionally managed group sample. Group characteristics are positively related to team rating of performance and to fewer dollars lost to absenteeism for the self-managing work team sample, but are related to QWL for the traditional sample. Finally, a supportive employee involvement context is positively related to QWL in both samples, and is related to manager ratings of performance in the self-managing work team sample.

DISCUSSION

This study tests a theory of self-managing work team effectiveness. It permits the examination of the relative strength of predictors drawn from competing theories of the effectiveness of self-managing work teams and other groups. For each of four categories of variables, a weighted index of the scales was defined based on the measurement model of the independent variables. We focused on the relationship between these four indices and a set of outcomes, not the relationship between specific variables comprising the indices and outcomes. This follows from our interest in testing the relative strength of different theoretical explanations of self-managing team effectiveness. It also reflects the limitations of our sample size. Although our sample size is large by the standards of small group research, it is small relative to the total number of first-order variables measured.

Measurement Model

Our measurement model indicates that there was considerable empirical overlap between the four indices. This in part reflects the disparate theoretical concerns of many prominent researchers. Hackman

has developed theories of task design and group characteristics; Lawler has developed theories of task design and employee involvement; and so on. Theorists whose work has focused on just one of the four predictor domains examined here also have borrowed from the other domains. The result is that variables used in one theory are not always conceptually distinct from those in other theories.

When the focus is on only one explanation of effectiveness, the theoretical overlap between different frameworks is not obvious. When we combine the predictors into a more comprehensive model and test them simultaneously, however, the degree to which different models share similar variables becomes clearer. Indeed, the test of our measurement model led us to revise our initial framework to reduce the redundancy of variables.

We moved variables to the categories in which they loaded most heavily. This decision required a judgment call that others could make differently on theoretical grounds. For example, we moved the power variable from the employee involvement category to the work design category, noting its close association with task autonomy. Our data suggest that employees viewed influence over both task and non-task matters as work attributes, since the power variable included items concerning power over non-task matters (such as employee influence over personal development and communication systems). However, other constructions are possible on theoretical grounds. Adler (1993) argues that job autonomy is only one form of decision-making power, and that influence over a system that generates standardized work methods can provide meaningful employee involvement even if jobs permit little autonomy. This implies that job autonomy is part of a broader employee involvement category. Similarly, we moved the task feedback variable to the employee involvement context category, where it is closely associated with a broader information variable. Task feedback seems to be less intuitive for employees than other job characteristics, and employees do not appear to make clear distinctions between feedback from the task and feedback from agents. One could argue on theoretical grounds, however, that communication from both tasks and agents belongs in the work design category.

Rather than imposing our own theoretical preferences on the data, we have chosen to let the data guide our judgment calls about categorizing variables. Different choices on theoretical grounds would have weakened the structural model due to increased measurement error and could have led to a different

structural solution. Also, it is possible that different measures of the variables in our model would have resulted in a different measurement model and, hence, and a different structural model. Future research using different operationalizations of variables or different measurement instruments would be useful in addressing this possibility.

Relationships Between Predictors and Dependent Variables

The overall pattern of relationships between independent variables and dependent variables in the structural equation model is consistent with our hypotheses, but only some of the paths tested were confirmed. For the self-managing work team sample, six of 16 tested paths between independent and dependent variables were significant. For the traditional work groups, four of 16 tested paths were significant. The general pattern is that there is a significant direct path between each of the independent variables and one or more dependent variables for both samples. Because of the relationships among the dependent variables, however, a number of other predictor variables are indirectly related to other dependent variables. Most of the predicted relationships between independent and dependent measures hold, directly or indirectly.

It is interesting that same-source method bias does not explain those paths that are significant and those that are not. For the self-managing work team sample, three of eight paths to objective independent variables (manager ratings and absenteeism) were significant, while three of eight paths to same-source dependent variables (QWL and team ratings) also were significant. For traditional groups, one of eight paths to objective independent variables was significant and three of eight paths to same-source dependent variables were significant.

We suspect that multicollinearity among the independent variables is the major culprit suppressing the significance level of many tested paths between independent and dependent variables. The measurement model of the independent variables indicates that the latent variables are significantly different from unity, but nonetheless they are significantly correlated. Multicollinearity increases the standard errors of the coefficients, making it harder for each path to achieve significance, especially when the number of cases per path is small. In fact, the magnitude of the path coefficients that are not significant is relatively high in general. Only the strongest paths achieve significance. Future research can attempt to overcome these

problems by increasing sample size and by using independent measurement or different operationalizations that reduce same-source methods bias.

Our results indicate that a practitioner interested in designing effective self-managing work teams should first focus on enhancing the context for employee involvement. Employee involvement context has the strongest relationships to both quality of work life and manager ratings of performance. Other research on teams in knowledge and service settings has also found that the design of an empowering organizational context is critical for effectiveness (Mohrman, Cohen, & Mohrman, 1995; Cohen & Spreitzer, 1994). Contextual factors may play a more critical role for teams in knowledge and service settings due to the nature of the work. When work is less routine and the cause and effect relations are not fully understood, judgment is required (Thompson & Tuden, 1959). Exercising judgment requires the availability of information, feedback, resources, training, and recognition--that is, an organizational context that supports high employee involvement. When work is more routine, such as in most manufacturing settings, these organizational design factors may not be as powerful.

Also important, to a somewhat lesser extent, are group task design and group characteristics. An important finding is that different classes of predictor variables appear to affect different outcomes directly. Only group characteristics predict absenteeism, only employee involvement context predicts quality of work life, and only group task design and group characteristics predict team ratings of performance. An unexpected finding was that neither group task design nor group characteristics were related to quality of work life. This pattern suggests that no predictor has a positive effect on all outcomes, and that it may be necessary to affect multiple predictor categories to change the overall level of effectiveness of self-managing teams. This makes intuitive sense, but is counter to the generalized effects claimed for each set of predictors in the literature.

The major surprise in the structural equation model is encouraging supervisory behavior, which shows no significant relationship to any dependent variable for the traditional work group sample and only a significant negative relationship to manager performance ratings for the self-managing team sample. This pattern calls into question the self-leadership theory of Manz & Sims (1986; 1987; 1989). Manz and Sims (1987) found a positive relationship between self-leadership and coordinator effectiveness, but did not

examine its impact on team effectiveness. It is interesting that the bivariate correlations between the encouraging supervisory behavior index and several outcomes are significant when there is no control for other predictors (see Table 4).

There are several possible explanations for the results on supervisor variables. First, the structural equation models may accurately capture the relationships among variables. Variables that co-vary with encouraging supervisory behavior (group task design, employee involvement context, and group characteristics) explain the relationship between self-management and dependent variables. Once all the independent variables are examined simultaneously, the positive relationship between supervisory behavior and outcomes is shown to be spurious.

Second, supervisors may be more likely to exhibit "encouraging" behaviors with teams that management knows are performing less well, and are less likely to exhibit these behaviors or even interact with teams that are performing well. Also, higher-level managers may infer that self-managing teams are struggling if they receive ("need") more help from supervisors. This would explain why there was a significant negative relationship between supervisory behavior and management performance ratings but not team performance ratings.

Another possibility is that the more supervisors intervene in the life of self-managing work teams, the more they obstruct effective performance. Beekun (1989) found in a meta-analysis that self-managing work teams without supervisors performed better than those with supervisors. Thus, supervisory behavior, no matter how well-intentioned, may undermine team performance.

There was no significant relationship between encouraging supervisory behaviors and outcomes in the traditionally managed sample. Perhaps supervisors of poorly performing traditional groups responded by using more control rather than by encouraging more self-regulation. Alternatively, traditional groups may not experience encouraging self-regulation or other supervisor interactions as detrimental because they are accustomed to supervisory direction.

In general, these findings do not support self-leadership theory, suggesting that the best leadership of self-managing groups is no leadership at all. This calls for further testing of Manz and Sims' (1987) theory.

The significant paths for self-managing teams and traditionally managed groups are quite different. The only significant path shared by the two models is between employee involvement context and quality of work life. This is unexpected due to self-managing teams theories arguing that the same characteristics predict the effectiveness of both self-managing work teams and traditionally managed work group (e.g., Cummings, 1981; Hackman, 1986). Self-managing teams are portrayed as having more of what makes any group successful. Our study reinforces the importance of using comparison groups in studies of self-managing work team effectiveness in order to test whether causal determinants are unique to self-managing work teams.

Relationships Among Dependent Variables

The relationships among outcomes indicate that quality of work life leads to performance as rated by the team, and in turn performance as rated by the manager. For the self-managing work team sample only, team ratings are negatively associated with absenteeism and manger ratings are positively associated with absenteeism. The finding that quality of work life leads to performance may appear inconsistent with considerable research indicating that employee satisfaction typically does not cause performance, and indeed the opposite causal pattern may be more nearly true (Lawler, 1973). Some research has indicated the service organizations may present a different pattern (e.g., Schneider & Bowen, 1985). Employee morale may be reflected in service organization performance because customer service is the key performance indicator, and customers can detect and are affected by the level of employee satisfaction. Most groups in our study were customer service teams. Thus, the particular pattern of relationships among outcome variables that we found may reflect our sample. Further research is needed to determine whether it is characteristic of work teams in manufacturing and other settings.

Limitations and Contributions

The present study is not without limitations. First, a larger sample size would have allowed a more fine-grained analysis of the model. For example, a larger sample would have made it possible to conduct a multiple group analysis in LISREL, across self-managing and traditionally managed teams, in order to test the significance of the differences in the paths in the structural model. A larger sample would also have allowed us to model the individual variables comprising each of the four theoretical perspectives, rather

than just the aggregated construct. Second, given the cross-sectional nature of the data, we cannot test causality directly, although the hypotheses imply causation. Causal direction may be reversed on further investigation. For example, self-managing work team effectiveness could lead to more employee involvement. Although we believe our hypotheses are well grounded in prior theory, experimental or longitudinal data are needed for more definitive results.

Third, the overall fit of the structural models could not be examined because the model we estimated was saturated (that is, all links were hypothesized). Future research should estimate models that replicate our results (that is, using only the significant paths) on a new sample in order to assess the overall fit of the structural model. Here, however, our research makes a contribution because it permits future testing of our structural model with a much smaller number of cases in a different data set.

Fourth, we were not able to control for the technology or the nature of the task. Prior research has shown that the technology and type of work performed explains a significant proportion of the variance in team effectiveness (Hackman & Morris, 1975; Kabanoff & O'Brien, 1979). The teams in our sample performed a wide variety of tasks, ranging from taking customer orders to repairing telephone lines. Our interviews suggested that the job design in the craft area, based on a geographic turf and identification with a set of customers, provided supportive conditions for the self-managing team concept, which was not replicated in the sales and service arena (Cohen & Ledford, 1994). Thus, it is likely that predictive models for self-managing teams performing different types of work would systematically vary. Unfortunately, because our test of the comprehensive model of self-managing team effectiveness required a large sample, and we did not have sufficient numbers of teams performing each type of work, we were not able to compare results from predictive models that differentiated teams by technology or the type of work they performed.

In addition, organizational level variables such as culture, structure, and extent of change (e.g., downsizing, TQM efforts) may also impact the effectiveness measures examined. However, because our sample was collected from one large organization, we were unable to examine these contextual influences. Further research is clearly needed to conduct these more fine-grained analyses.

In spite of these limitations, this study makes a number of important contributions to the literature on self-managing teams. This study develops and tests a comprehensive, theory-driven model of self-managing team effectiveness. Previous studies have been more piecemeal, looking at only a subset of predictor variables and/or components of effectiveness. Even studies that include multiple criteria of effectiveness tend to examine only one dependent variable at a time rather than simultaneously, as is possible with causal modeling. The use of four dependent variables permits us to examine the differential effects of the predictor variables as well as the interrelationship among the dependent variables. Prior studies are vulnerable to omitted variable biases with respect to both predictor and dependent variables. Thus, a key contribution of this research is that it simultaneously examines a more complete set of independent and dependent variables, thus minimizing the potential for biases.

A second contribution is the use of a diverse sample that is unusually large by the standards of field research on small groups. This permitted more complex modeling than usually is possible in small group research. The best prior studies (e.g., Goodman, 1979; Wall et al., 1986) have been conducted in a single location that uses a single technology and an essential uniform implementation of self-managing work teams. The teams in our study performed a wide variety of tasks and were implemented at different times and in different ways. Such a diverse sample is less subject to biases that may arise from the use of a small, relatively uniform, and possibly unrepresentative sample of teams.

Third, the sample is constituted of teams from a firm in the service sector. Most prior research on self-managing teams has focused on the use of teams in manufacturing organizations, even though the service sector is a much larger part of modern economies and still growing. As noted in the discussion of the results above, a number of the predictor variables (e.g., employee involvement variables) are believed to be more critical in a service or knowledge-work setting where work is more complex and less routine than in a manufacturing setting when work is more routine and pre-specified. A final contribution is that the study examines differences between self-managing teams and traditionally managed teams. Consequently, this research helps to clarify the basis for added value of self-managing teams beyond teams that are traditionally managed.

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GERALD E. LEDFORD, JR. is a Senior Research Scientist at the Center for Effective Organizations, Graduate School of Business, University of Southern California. He received is B.A. in Psychology from George Washington University and his M.A. and Ph.D. in Psychology from the University of Michigan. He has conducted research, published, and consulted on a wide variety of approaches to improving organizational effectiveness and employee well-being, including employee involvement, innovative reward systems, organization design, job design, and union-management cooperation. He has done especially extensive research on high involvement organizations, and skill-based pay and other alternative reward systems. He has published 40 articles and book chapters and is co-author of four books, including *Employee Involvement and Total Quality Management: Practices and Results in Fortune 1000 Companies* (1992) and *Large-Scale Organizational Change* (1989). He is an active member of the American Psychological Association, the Academy of Management, and American Compensation Association.

GRETCHEN SPREITZER is on the faculty of management and organization at the University of Southern California Graduate School of Business Administration where she is also a faculty affiliate of the Center for Effective Organizations. She completed her doctoral work in organizational behavior at the University of Michigan. Her research and teaching interests are in the areas of employee empowerment, organizational change, and managerial development, particularly within a context of organizational change and decline. She is an active member of the Organization Development and Change Division of the Academy of Management where she serves on their Executive Board.

TABLE 1

Descriptive Statistics and Correlations[a]

Measure	Mean	S.D.	1	2	3	4	5	6	7	8	9
Group Task Attributes											
1. Variety	5.24	.79	(.92)								
2. Feedback	4.72	.85	.48***	(.90)							
3. Identity	5.00	1.07	.52***	.42***	(.88)						
4. Autonomy	5.15	.99	.55***	.54***	.68***	(.90)					
5. Significance	5.70	.68	.57***	.56***	.29**	.38***	(.82)				
Encouraging Supervision											
6. Self-criticism	4.01	.92	.12	.21*	.31***	.11	.10	(.95)			
7. Self-rehearsal	4.17	.96	.18*	.32***	.11	.21*	.24**	.46***	(.93)		
8. Self-management	4.60	.99	.17	.36***	.00	.18*	.25**	.48***	.81**	(.98)	
Group Characteristics											
9. Coordination	4.12	.88	.17	.06	.12	.23**	.02	.10	.14	.14	(.84)
10. Stability	5.55	.91	.15	.15	.26**	.42***	.15	.03	.11	.08	.32***
11. Norms	5.14	.73	.27**	.28**	.24**	.39***	.19*	.05	.26**	.29**	.64***
12. Expertise	5.14	.73	.29**	.34***	.31***	.43***	.26**	.19*	.28**	.29**	.66***
13. Innovation	5.32	.68	.38***	.27**	.31***	.45***	.29**	.16	.27**	.28**	.55***
Employee Involvement Context											
14. Power	2.75	.65	.49***	.56***	.63***	.80***	.42***	.24**	.27**	.32***	.22*
15. Information	2.85	.50	.34***	.53***	.26**	.42***	.26**	.24**	.50**	.63***	.13
16. Recognition	4.03	.92	.30***	.55***	.30***	.51***	.32***	.16	.40**	.50***	.01
17. Training/Resources	4.87	.74	.29**	.51***	.39***	.54***	.25**	.03	.28**	.28**	.24**
Quality of Work Life											
18. Trust	3.63	.86	.19*	.36***	.39***	.53***	.17	.10	.28**	.32***	.16
19. Commitment	4.82	.64	.28**	.43***	.31***	.53***	.34***	.08	.27**	.33***	.21*
20. Overall Satisfaction	5.14	.62	.42***	.44***	.37***	.59***	.32***	.12	.36**	.37***	.48***
Perceived Team Performance											
21. Team Rating	5.38	.58	.32***	.31***	.36***	.49***	.25**	.15	.17*	.30***	.46***
22. Manager Rating	3.53	.70	.19*	.10	.05	-.02	.11	.06	.07	.07	.15
Absenteeism											
23. Dollars	1937	1797	.21*	.14	.31***	.26**	.14	-.03	-.08	-.07	.08

[a] N=98-133 due to pairwise deletion of cases. The alpha coefficients of reliability for scales with more than two items are displayed in parentheses on the diagonal.

*p<.05

**p<.01

***p<.001

TABLE 1 Continued
Descriptive Statistics and Correlations[a]

Measure	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Group Task Attributes														
1. Variety														
2. Feedback														
3. Identity														
4. Autonomy														
5. Significance														
Encouraging Supervision														
6. Self-criticism														
7. Self-rehearsal														
8. Self-management														
Group Characteristics														
9. Coordination														
10. Stability	(.79)													
11. Norms	.32***	(.88)												
12. Expertise	.37***	.63***	(.84)											
13. Innovation	.34***	.66***	.56***	(.83)										
Employee Involvement Context														
14. Power	.33***	.39***	.41***	.46***	(.95)									
15. Information	.17*	.36***	.34***	.38***	.48***	(.83)								
16. Recognition	.14	.24**	.31***	.26**	.56***	.65***	(.81)							
17. Training/Resources	.23**	.46***	.47***	.32***	.55***	.48***	.54***	(.88)						
Quality of Work Life														
18. Trust	.15	.28**	.39***	.21*	.50***	.43***	.58***	.50***	(.82)					
19. Commitment	.21*	.40***	.44***	.25**	.56***	.37***	.50***	.55***	.68***	(.84)				
20. Overall Satisfaction	.25**	.56***	.61***	.51***	.61***	.44***	.53***	.57***	.64***	.73***	(.90)			
Perceived Team Performance														
21. Team Rating	.25**	.53***	.47***	.47***	.50***	.40***	.32***	.56***	.45***	.55***	.62***	(.82)		
22. Manager Rating	.09	.04	.11	.26**	.07	.02	-.11	-.01	-.12	-.05	-.03	.14	(.97)	
Absenteeism														
23. Dollars	.17	.14	.06	.21*	.18	.05	.06	.01	.07	-.08	.12	.03	.04	--

[a] N=98-133 due to pairwise deletion of cases. The alpha coefficients of reliability for scales with more than two items are displayed in parentheses on the diagonal.

*p<.05
**p<.01
***p<.001

TABLE 2

Results of the Measurement Model of the Independent Variables

Latent Variable	ULS Loadings	ML Loadings
Group Task Design		
Autonomy	.90	.92
Identity	.68	.75
Variety	.63	.61
Power	.93	.87
Encouraging Supervisory Behavior		
Self-Management	.91	.96
Rehearsal	.87	.82
Group Characteristics		
Expertise	.81	.76
Stability	.25	.26
Norm	.80	.82
Coordination	.58	.64
Innovation	.79	.77
Employee Involvement Context		
Information	.76	.78
Mgmt. Recognition	.74	.79
Training/Resources	.71	.65
Feedback	.71	.70

Goodness of Fit Statistics	ULS	ML
Chi-Square (degrees of freedom)	--	151.65 (84)
GFI	.98	.88
AGFI	.97	.82
RMSR	.06	.07

TABLE 3

Nested Measurement Models of the Independent Variables

Model	**Chi-square**	**d.f.**	**AGFI**	**RMSR**	**NCNFI**
Null Model	1030.45	105	.279	.327	--
1 Factor Model	494.58	90	.524	.125	.61
3 Factor Model	257.91	87	.705	.086	.83
4 Factor Model	151.65	84	.82	.07	.93

TABLE 4

Means, Standard Deviations, and Correlations for Variables in the Structural Equation Models for Self-Managing and Traditionally Managed Teams [a]

		Mean[c]	S.D.	1	2	3	4	5	6	7	8
1.	Group Task Design[b]	**3.60**	**.62**	**(.82)**							
		3.38	.53								
2.	Encouraging Supervisory Behavior	**3.97**	**.84**	**.23**	**(.81)**						
		3.87	.81	.18							
3.	Group Characteristics	**3.74**	**.45**	**.49****	**.26***	**(.82)**					
		3.43	.36	.36**	.33**						
4.	Employee Involvement Context	**3.08**	**.48**	**.73****	**.52****	**.40****	**(.81)**				
		2.96	.43	.51**	.51**	.38**					
5.	Quality of Work Life	**4.66**	**.61**	**.50****	**.29***	**.38****	**.64****	**(.85)**			
		4.41	.62	.65**	.45**	.52**	.69**)				
6.	Team Rating of Performance	**5.57**	**.57**	**.50****	**.21**	**.62****	**.36****	**.47****	**(.82)**		
		5.23	.54	.44**	.28*	.41**	.56**	.66**			
7.	Manager Rating of Performance	**3.65**	**.66**	**.26***	**-.11**	**.30***	**.35***	**.32***	**.41****	**(.97)**	
		3.38	.73	.18	.05	.17	.29*	.15	.33*		
8.	Absenteeism Dollars Lost	**2129**	**1952**	**-.28****	**-.31***	**-.43****	**-.21**	**-.15**	**-.41****	**-.16**	**--**
		1787	1744	-.49**	-.02	-.01	-.16	-.22	-.13	-.11	--

[a] N = 69. Values in boldface are for the Self-Managing Team sample; values on subsequent lines in standard print are for the Traditionally Managed Team sample.

[b] The alpha coefficients of reliability for scales with more than two items for the combined Self-Managing Teams and Traditionally Managed samples are displayed in parentheses on the diagonal.

[c] The means are weighted averages for each index, such as group task design.

*p < .05, two-tailed test.

**p < .01, two-tailed test.

TABLE 5

t-Tests between Self-Managing Work Teams and Traditionally Managed Teams on all Variables in the Model[a]

Variable	**Self-Managing mean**	**Traditional**	***t*-value mean**
Group Task Design[b]	3.60	3.38	2.21*
Autonomy	5.32	5.00	1.86*
Power	2.92	2.61	2.86**
Identity	5.17	4.87	1.62
Variety	5.33	5.17	1.21
Encouraging Supervisory Behaviors	3.97	3.87	.66
Self-Management	4.71	4.51	1.21
Rehearsal	4.17	4.18	.06
Group Characteristics	3.74	3.43	4.39***
Expertise	5.37	4.93	3.64***
Stability	5.59	5.51	.46
Norms	5.34	4.94	3.38***
Coordination	4.50	3.77	5.52***
Innovation	5.55	5.13	3.75***
Employee Involvement Context	3.08	2.96	1.48
Information	2.97	2.76	2.37**
Feedback	4.77	4.68	.55
Recognition	4.14	3.95	1.26
Training/Resources	4.90	4.83	.53
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Quality of Work Life	4.66	4.41	2.35**
Satisfaction	5.28	5.02	2.49**
Commitment	4.87	4.77	.96
Trust	3.84	3.45	2.72**
Team Rating of Performance	5.57	5.23	3.53***
Manager Rating of Performance	3.65	3.38	2.01*
Short-Term Absenteeism (Dollars Lost)	2537	1787	2.19*

[a]Index means tend to be lower in magnitude than individual scale means due to the fact that they are weighted means rather than raw means.

One tailed probabilities: * p= .05, ** p = .01, ***p = .001

FIGURE 1
Model of Self-Managing Work Team Effectiveness

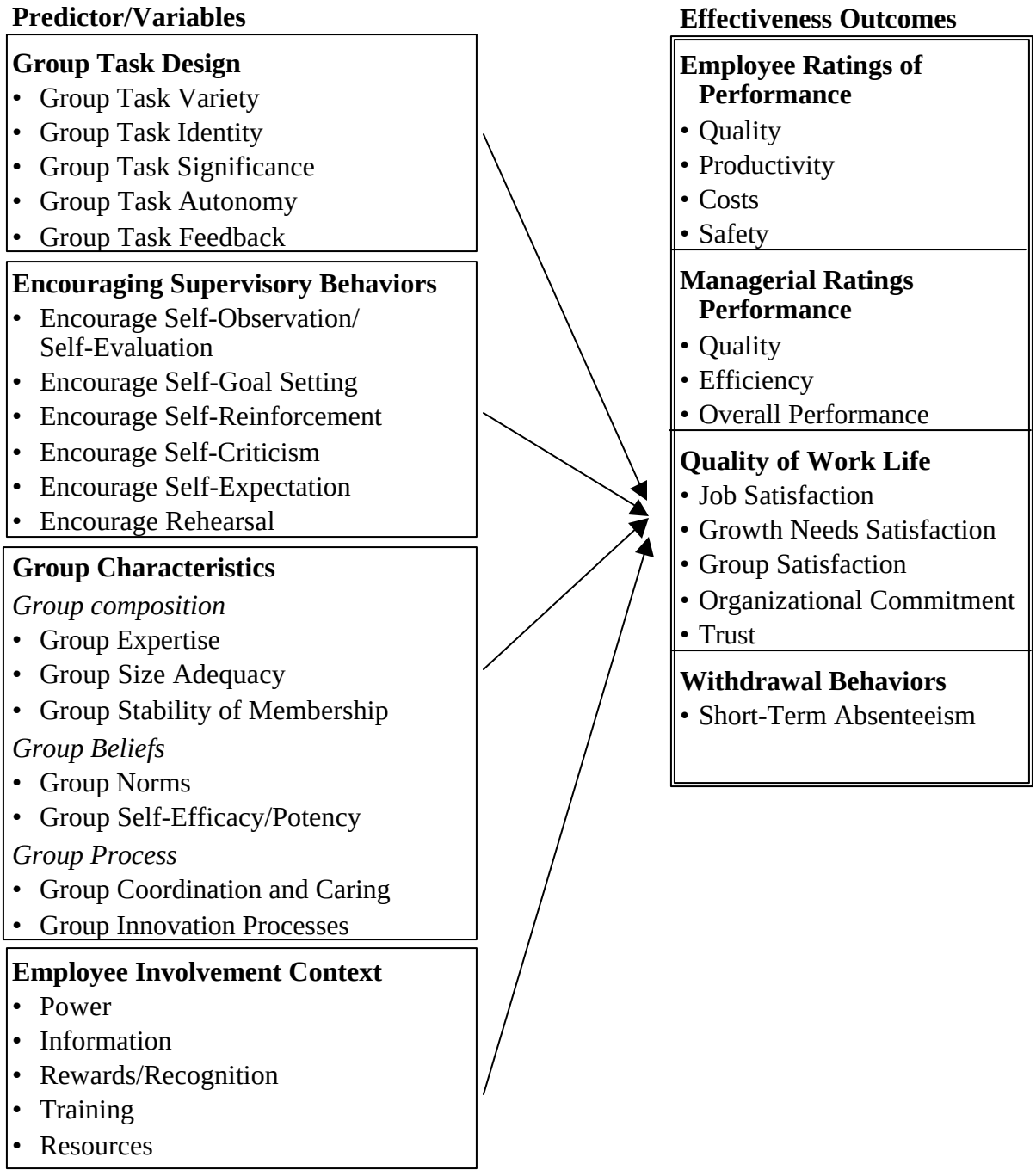

FIGURE 2
Independent Variable Measurement Model

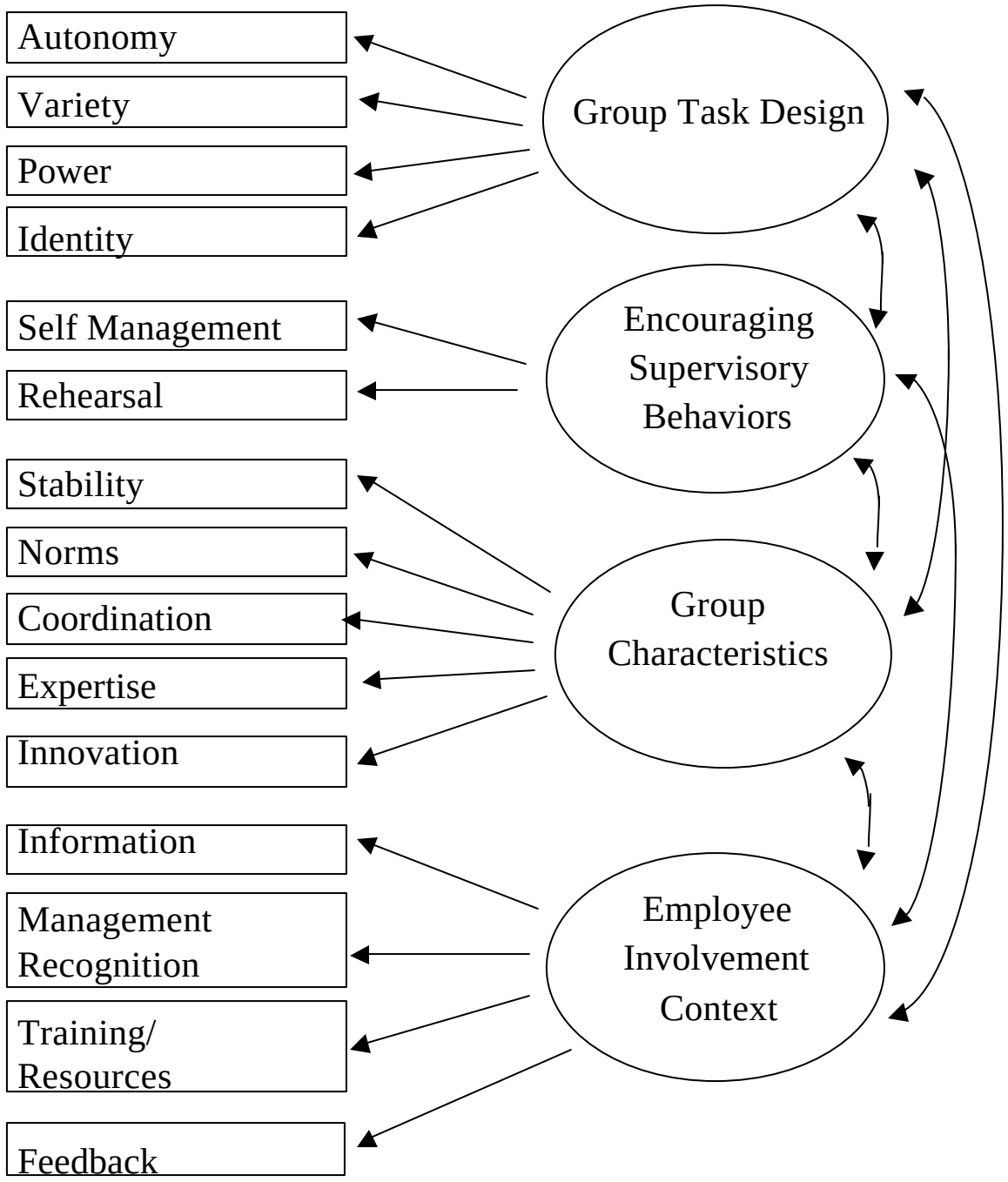

FIGURE 3
Structural Equations Modeling
Self-Managing Work Team and Traditionally Managed Work Team Samples

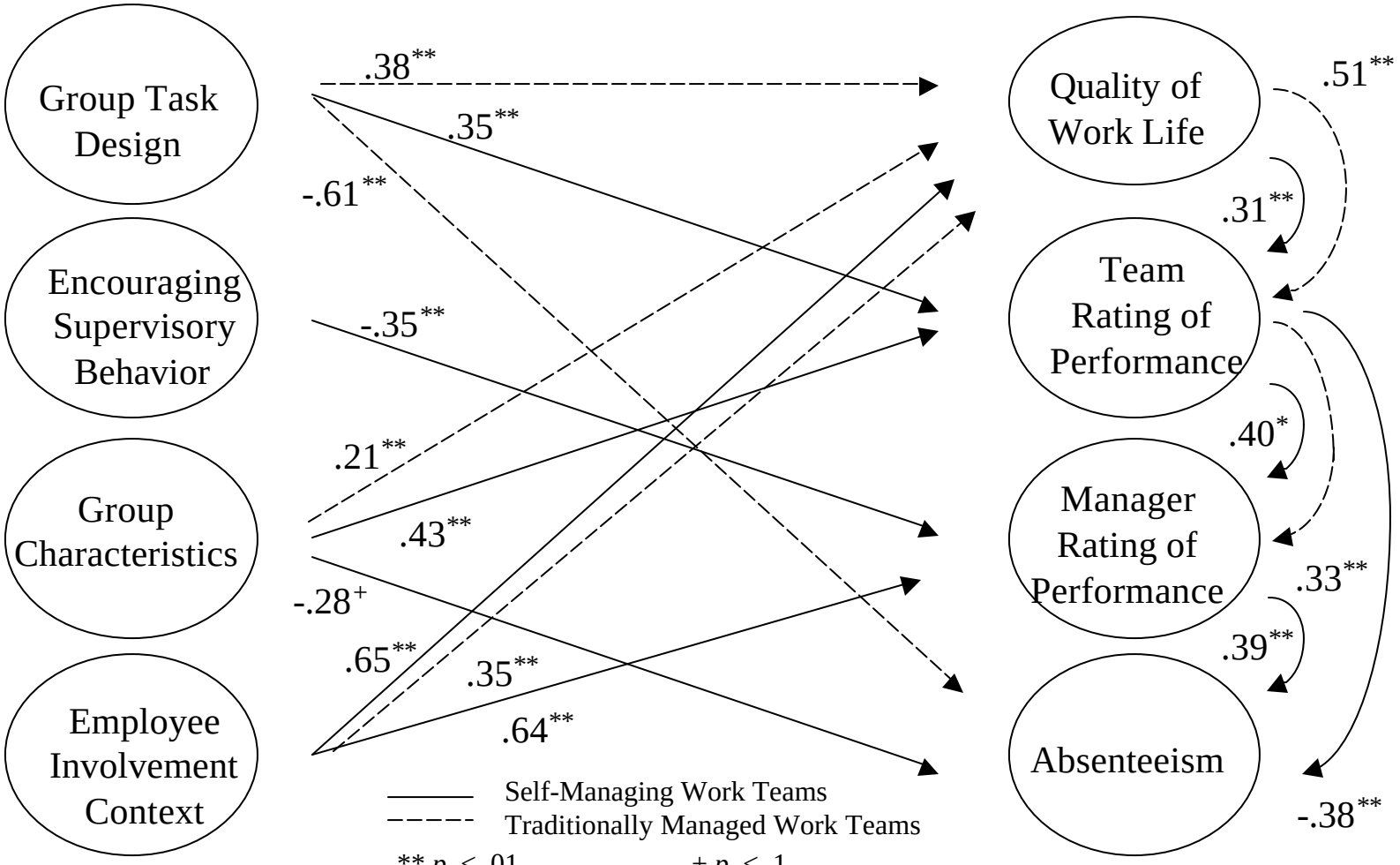

Figure 4.
Structural Equations Modeling
Full Work Team Sample