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CEO Publication
G 91-6 (191)

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Center for Effective Organizations - School of Business Administration
University of Southern California - Los Angeles, CA 90089-1421 (213)740-9814

THE EFFECTIVENESS OF SELF-MANAGING TEAMS: A QUASI-EXPERIMENT

This study uses a quasi-experimental design to assess the effectiveness of self-managing teams in a telecommunications company. These teams performed customer service, technical support, administrative support, and managerial functions in a variety of locations. The balance of evidence indicates that self-managing teams were more effective than comparable traditionally-managed groups that performed the same type of work. The study illustrates the value of a collaborative research project in which researchers and clients jointly define the research questions, study design, and methods.

KEY WORDS: Self-managing teams, self-regulating teams, team effectiveness

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The authors wish to thank Ed Lawler for his assistance in designing the study and helpful comments on an earlier draft of this paper. We are grateful to Richard Hackman, Davydd Greenwood, Craig Lundberg, and the anonymous reviewers for their helpful comments on earlier drafts of this work. We gratefully acknowledge the support of Lei Chang in designing and executing many of the statistical analyses reported in this paper and Alice Yee Mark for her assistance in data collection and management. Finally, we wish to thank the telecommunications company for its financial support and involvement in the study.

INTRODUCTION

The use of self-managing work teams has increased as a response to the competitive challenges of the past two decades. Managers have implemented self-managing teams to improve quality, productivity, and quality of work life (QWL). A recent survey of employee involvement practices found that 47% of Fortune 1000 companies were using self-managing work teams with at least some employees and 60% planned to increase their use in the next two years (Lawler, Mohrman, and Ledford 1992). Despite the growing prevalence of self-managing teams, empirical evidence regarding their effectiveness has been limited.

Self-managing teams are groups of interdependent individuals that can self-regulate their behavior on relatively whole tasks (Cumming & Griggs, 1977; Goodman, Devadas, & Hughson, 1988). Key characteristics of such teams are: (1) face to face interaction (Goodman et al., 1988); (2) employees with interrelated tasks who are responsible for making a product or providing a service; 3) employee discretion over decisions such as task assignments, methods for carrying out the work and scheduling of activities (Goodman et al, 1988). Typically, the members of self-managing teams have a variety of skills relevant to the group task and the team receives feedback on its performance (Wall, Kemp, Jackson, & Klegg 1986). Self-managing teams may or may not have direct supervisors.

Self-managing teams are hypothesized to be effective and contribute to employee quality of work life for two major reasons. First, they permit employee self-regulation or self-control over changing conditions facing the group. The sociotechnical perspective emphasizes the structural properties of self-managing teams that enable employees to control key sources of performance variance (Cummings, 1978; Susman, 1976). Social learning theory indicates that SMTs encourage self-regulation through cognitive and behavioral mechanisms, such as self-goal-setting (Manz & Sims, 1987). Second, the work and organizational designs for self-managing teams are motivating. Work high in task variety, autonomy, identity, significance, and feedback foster internal work motivation, which in turn leads to high performance and satisfaction (Hackman & Oldham, 1975). These are the

same work characteristics described in the sociotechnical literature, which is why several have argued for their integration (Rousseau, 1977; Cummings, 1978; and Wall et al., 1986). Organizations help to motivate team members to perform well by sharing power and rewards with them (Lawler, 1986; Hackman, 1987).

Evidence about the Effectiveness of Self-Managing Teams

Most of the evidence about self-managing team effectiveness comes from case studies, although there have been a few quasi-experiments. In general, the literature suggests that self-managing teams have a modest impact on performance and the attitudes of team members, but the changes are limited to the direct targets of the intervention (Goodman et al., 1988). Most studies have found that self-managing teams have a direct impact on quality. For example, the Topeka pet foods plant (Walton, 1972) and the Uddevalla Volvo plant (Kapstein & Hoerr, 1989) reported significant quality improvements. In addition, the review by Cummings, Molloy and Glen (1977) found that six out of seven studies using self-managing team designs reported improved quality. The Pasmore, Francis, and Haldeman (1982) review found that 100% of the sociotechnical interventions that used self-managing team designs claimed quality improvements.

The findings about productivity benefits are modestly positive. Overall, the Topeka plant reported cost savings and productivity improvements (Walton, 1982). The Volvo Udevalla plant claimed that it has achieved higher productivity than comparable plants (Kapstein & Hoerr, 1989). A careful study of self-managing teams in a coal mine found slight positive productivity effects (Goodman, 1979). The quasi-experimental study of a confectionary plant by Wall, Kemp, Jackson, & Klegg (1986) did not find productivity differences comparing self-managing teams to traditionally-managed groups, although cost savings resulted from the need for fewer supervisors. The Cummings et al. (1977) review found that six studies showed productivity increases and one showed a decrease. In the Pasmore et al. (1982) review, 89% of the studies using self-managing teams reported increased

productivity. Beekun's (1987) meta-analysis found that self-managing teams resulted in modest productivity improvements.

The vast majority of studies report improvements in employee satisfaction and quality of work life indicators specific to the self-managing team intervention, such as job satisfaction. The results are inconsistent for other attitudinal indicators such as organizational commitment (Goodman et al., 1988).

Finally, the effects of self-managing teams on absenteeism, safety, and health have been less systematically studied and results are inconsistent. For example, Beekun's meta-analysis (1987) found that self-managing teams decreased absenteeism and turnover. In contrast, Cordery, Mueller, & Smith (1991) found that employees in self-managing teams have higher rates of absenteeism and turnover than their counterparts in traditional jobs. Both studies of the Topeka plant (Walton, 1972) and Rushton mine (Goodman, 1979) reported safety improvements. Wall et al. (1986) did not report any impact of self-managing teams on mental health, and in fact, reported that managers experienced more stress in operating this work system than its traditional counterpart. Some in the union movement (e.g., Parker & Slaughter, 1988) have argued that self-managing teams and other team-based interventions are a form of "management by stress" that have long-term negative effects on worker safety and health.

Overall, there has been a paucity of high quality studies. In general, the more rigorous the design, the more modest the results (Goodman et al., 1988; Wall et al., 1986). Wall et al. (1986), and Pasmore et al. (1982) have called for research based on quasi-experimental designs in which comparisons are made with appropriate comparison groups and causal inferences can be drawn. Most studies have taken place in a single location in which all teams perform similar types of work. We lack empirical evidence concerning the effectiveness of self-managing teams across different types of jobs. In addition, the vast majority of studies of self-managing teams have occurred in manufacturing plants and the results of studies in manufacturing firms may not generalize to service organizations.

Research Intentions

The present study, a large scale evaluation of the effectiveness of self-managing teams in a telecommunications organization, attempts to remedy these deficiencies. It takes advantage of a naturally occurring field quasi-experiment to assess whether self-managing groups in technical service, customer service, administrative support, and management functions are more effective than comparable traditionally-managed teams. The basic research question underlying this study is: Do self-managing teams improve quality of work life, performance, and behavioral outcomes?

Specifically, we predicted that self-managing teams would be higher than traditional work groups on attitudinal indicators of QWL, such as satisfaction with the job and work group. We also predicted that self-managing teams would be higher than traditional work groups on measures of work performance (for example, productivity and quality). We made a one-tailed prediction of positive effects on QWL and overall work performance, since the clear majority of prior studies have found positive effects. We also investigated the effects on self-managing teams on safety, health, and absenteeism. As we mentioned, different studies have found that self-managing teams have both positive and negative effects on these outcomes. Thus, we made no prediction about the direction of safety, health, and absenteeism effects.

METHODS

Research Procedures and Sample

We studied self-managing teams that a telecommunications company had implemented in a variety of functions over several years. These teams were designed and implemented under the sponsorship of local managers, who hoped to improve quality, customer service and productivity. Prior to diffusing this innovation, top management wanted to know whether self-management improved team effectiveness and QWL outcomes, and what factors accounted for any differences. They asked us to conduct a study. Before we agreed to do this research, we interviewed a sample of employees and managers involved with implementing self-managing teams. Our interviews indicated

that the company had implemented "real" self-managing teams in a variety of work functions and that the self-managing teams varied in their designs and implementation processes. The interviews persuaded us that this was an important opportunity to study self-managing teams that performed different tasks in a variety of settings.

The company was actively involved in the research design process. A study team was established, comprised of approximately ten middle managers representing different functional and geographic areas and four local union presidents. We met with the study team six times over a nine month period. The study 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 thirteen hundred questionnaires, and helped disseminate study results.

Study team members identified the self-managing teams that were included in our study sample. Before they began this task, we discussed the self-managing team concept at length with study team members to insure that there was a common understanding of the concept. We wanted to make sure that their criteria for inclusion in the sample were not overly restrictive. For example, we did not want teams to be omitted from the sample simply because of labelling differences. This was an issue because different work locations used different labels for self-managing teams, including self-regulating work groups, self-designing teams, directed autonomy teams, and shared leadership teams. We also did not want a definition so narrow that it would lead us to miss naturally-occurring variation in the design characteristics of self-managing teams (for example, presence or absence of supervisors). This was important because lower-level managers had been given considerable latitude by the company to fashion self-managing teams that best suited local conditions. On the other hand, we did not want team members to use nomination criteria so vague that groups could be included in the sample simply because they were novel or unusually effective.

We attempted to avoid these problems by intensive discussions with the study team about the self-managing team concept. We defined self-managing teams as interdependent groups that are

organized around a particular customer service or equivalent responsibility, that are characterized by high levels of employee involvement in decisions, and that use nontraditional structures and management practices. We discussed how self-managing teams differed from other approaches to employee involvement such as problem-solving groups in terms of power to make decisions, access to information, training, and rewards, drawing heavily on Lawler (1986). Study team members relied on these discussions in determining whether teams from their areas belonged in the sample. We also used a manipulation check in the employee questionnaire (see below) to insure that our definition of self-managing teams was being used.

The study team identified 84 self-managing teams that performed the following functions: (1) technical service to external and internal customers (for example, installation and repair teams); (2) small business and residential customer service which involved recommending products and services, inputing customer orders, and resolving customer problems; (3) clerical support to engineers and other technical personnel; (4) management of engineers and other technical personnel. To the best of the study team's knowledge, it had selected all self-managing teams in the company.

The processes used to form self-managing teams varied by function and location. In the technical service and clerical support functions, second-level or third-level local management typically made the determination that self-managing teams could be beneficial for their area. Reasons for the transition were frequently idiosyncratic. For example, an immediate supervisor of a group of installers retired during a hiring freeze, and the second-level manager used this as an opportunity to create a self-managing group that functioned without a supervisor. In one geographical region of the company, the Senior Vice-President of Operations encouraged all his third-level managers to have at least one self-managing team under their jurisdiction. This region had 34 self-managing teams in operations as compared to 12, 4, and 5 self-managing teams in the other three geographic regions of the company. In the small business offices, the transition toward "directed autonomy teams" was part of a state-wide effort. The Senior Manager had worked with her third and second-level managers to

diffuse this innovation. At first, employees volunteered to "pilot" the effort and a few self-managing teams were operating side-by-side with traditionally-managed employees in selected small business offices. Over time, this decision was made at the business office level, and all employees in a business office were either organized into self-managing teams or were managed conventionally.

Once the decision was made to transition a work group toward self-management, typically employees were involved in the design. The degree of involvement varied by location. In general, employees in 72% of the self-managing teams reported that their group volunteered to be self-managing. Although there was considerable variation in how self-managing teams were formed, most employees perceived their group as being allowed to decide whether or not to become self-managing.

Once the self-managing teams were identified by the study team, we began selecting comparison groups that were matched by the type of work they performed. The matching process entailed several steps. We reviewed organizational charts to identify the population of groups that performed work similar to that of the self-managing teams. From this population of groups, we randomly selected matched comparison groups. For example, a switching maintenance crew would be matched with a switching maintenance crew and not with a repair crew. Out of the 20 switching maintenance crews on the organizational charts, we randomly selected one to be in the sample as a match. Although size was not an explicit factor in selecting matches, groups that performed the same type of work tended to be of approximately equal size. After making selections, we confirmed them with the study team. In several cases, we were not able to find comparable groups on the organizational charts, and we solicited advice from study team members. In general, when the appropriate match was not obvious, study team members helped us find an appropriate group with a different name. In a few cases, the work performed by self-managing teams was highly specialized and unique, and study team members were not able to identify an appropriate match; these groups were dropped from the analyses.

Data sources included employee questionnaires, supervisor questionnaires, manager questionnaires, questionnaires from union local presidents, performance data from small business sales

offices, and accident and absenteeism records. In addition, case studies of self-managing teams were completed using interview and observational data. Case studies were conducted on groups performing three out of the four major categories of work represented in our study--a telephone installation and maintenance crew, a small business office team, and an engineering clerical team. The case studies helped the researchers to understand the nature of the work being performed in different functions.

The questionnaires were distributed to all employees, supervisors, upper level managers, and union presidents in the sample, along with a separate appendix that listed and provided a unique code number for every work group in the sample. All respondents (other than union presidents to whom this did not apply) were asked to write down on their survey the code number for their work group or the one they managed. If a supervisor or manager had more than one group reporting to them, they filled out a separate questionnaire for each group. The group code number enabled data from employees, supervisors, and managers to be aggregated at the group level. Although the individual questionnaires were anonymous, this identification permitted us to connect a particular respondent to a group. Respondents mailed the surveys back to us directly using addressed, postage-paid envelopes.

In total, 1337 people completed the questionnaires from 163 different teams. We obtained employee data from 138 groups, supervisory data from 107 groups and managerial data from 127 groups, out of a possible total of 169 groups. These represented group response rates of 82%, 63%, and 75% respectively. We heard from a smaller number of supervisors, in part, because 20 self-managing teams did not have first-line supervisors. We would not have achieved these high initial response rates without the active involvement of the company study team.

Using screening criteria discussed below, we dropped 19 self-managing teams and 19 traditionally-managed groups from the employee data set, 12 self-managing teams and 19 traditionally-managed groups from the supervisory data set, and 18 self-managing teams and 21 traditional teams from the managerial data set. The final sample of groups used for analyses reported in this paper included employee data from 50 matched pairs of groups, supervisor/manager data from

38 matched pairs of groups, and manager data from 44 matched pairs of groups. These correspond, respectively, to 59%, 45% and 52% of groups in our original sample. Table 1 summarizes the response rates for the different questionnaires.

Insert Table 1 About Here

Groups were dropped from the original sample in order to make sure the data were of sufficient quality and appropriate matches could be found. Groups were considered to have sufficient data if two or more employees responded to the questionnaire. Twelve groups were excluded based on this criterion. Using a questionnaire item which had asked group members to indicate the number of members in each group, we compared the number of respondents to the reported size of each group. The ratio between the number of respondents in each group to the reported size of the group is .70 for groups remaining in the sample.

We made another check on the sample based on group size. In field research, there is always the possibility that respondents from the same work group will respond about different groups. This is because most employees are members of a nested set of groups. For example, respondents from the same repair crew may respond about their repair crew, the department that includes their crew, or the garage that includes several departments. We attempted to avoid this problem by having the respondent indicate their work group from a comprehensive list of all groups in the sample. We instructed respondents that all questionnaire items about their work group referred to the group they had specified. Nevertheless, wide variations in responses about group size indicated that some employees and supervisors responded about the larger organizational units that included their group. We dropped such cases from the analyses on the basis of the following decision rule. Cases were dropped if the respondents reported a group size that was more than two standard deviations above or below the mean. We then recalculated the average size of the group and rechecked for consistency

regarding group size. We excluded several groups due to size inconsistencies. The groups remaining in the sample had an median size of ten respondents and no group had less than three respondents.

We used the equivalent of an experimental manipulation check to help insure that groups which had been classified objectively as self-managing and traditional were so perceived by group members. Employees were given our definition of self-managing teams in the questionnaire, and were asked whether their group fit the definition. When there was a conflict between objective classifications by study team members and subjective classifications by group members, we used subjective classifications. Four groups were recoded as control groups rather than self-managing groups for this reason, while no control groups were recoded as self-managing. Thus, reliance on subjective (group member) classifications was a conservative approach. In addition, we removed groups from our final sample if less than 75 percent of the responding members failed to agree on its status as self-managing or not, regardless of the classification by study team members. Several groups were removed from the sample based on this criterion.

We repeated the process of selecting comparison groups matched by the type of work they performed after removing 38 groups from the initial sample. The original matches of self-managing teams and traditionally-managed groups could still be used in the vast majority of cases. All the other groups became part of a pool from which new matches could be made. The process was repeated for the employee, supervisory, and managerial data sets. Where possible, the same groups were matched across data sets.

Employees, supervisors, and managers often have different perspectives and complementary sources of information about group effectiveness and employee QWL (Lawler, 1986). Thus, employee, supervisory, and managerial questionnaire responses were treated as separate data sets. This also optimized the use of the information contained in each data set. If we had limited our analysis to the groups from which we had overlapping data from employees, supervisors, and managers, our sample size unnecessarily would have been considerably reduced. Data was received

from 81 self-managing teams and 82 traditionally-managed groups, a total of 163 groups. However, we received complete data from employees, supervisors, and upper level managers for only 36 self-managing teams and 40 traditionally-managed teams, a total of 76 teams. After dropping groups using screening criteria discussed above, we were able to find comparable matches containing overlapping data across all three data sets for only 12 pairs of self-managing and traditionally-managed groups. By treating the employee, supervisor, and managerial responses as separate data sets, we were able to maximize the numbers of matched pairs that could be used for analyses. Table 2 presents a breakdown of the overlap among the groups in our employee, supervisor, and manager data sets. It shows the overlap that occurred before and after the process of selecting matched pairs.

Insert Table 2 About Here

We used a post-test only nonequivalent control group design (Cook & Campbell, 1979) to investigate differences in effectiveness between self-managing teams and traditional groups. The use of matched pairs was particularly important in our study because it controlled for the impact of technology and task on performance outcomes. Prior studies have shown that the type of task explains as much as 30 to 50 percent of the variance in group effectiveness (Hackman & Morris, 1975; Kabanoff & O'Brien, 1979). The research design avoids threats to internal validity arising from history, testing, instrumentation, and regression (Campbell & Stanley, 1963). The research design does not control for some threats to validity. Selection differences are the primary threat to interpretation of results from a post-test only nonequivalent control group design (Cook & Campbell, 1979). That is, if high-performing individuals and groups are more likely to become self-managing teams, any differences in performance could be due to a selection bias rather than to self-management. Also, differential mortality is a threat to validity (Campbell & Stanley, 1963), meaning that if self-managing teams systematically lost more low performers than traditional groups

did, enhanced self-managing team performance could be due to mortality rather than self-management. Although these threats to validity cannot be ruled out through the quasi-experimental design, we collected demographic and attitudinal data that permitted us to explore these issues empirically. Cook & Campbell (1979) recommend this strategy.

Measures

We measured three domains of group effectiveness: group member QWL (e.g., job satisfaction), group performance (e.g., quality), and group member behaviors (e.g., accidents and absenteeism). Scores were computed for each team by averaging member responses to the employee questionnaire. If more than one supervisor responded to the supervisory questionnaire for a particular team, their responses were averaged. We followed the same approach with manager questionnaires.

We assessed QWL by means of a survey of group members. We adapted measures of **job satisfaction, growth needs satisfaction, and social needs satisfaction** from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983). We assessed **organizational commitment** using a short version of Mowday & Steers (1979) measure. We used Hackman's (1982) measure of **satisfaction with group membership**. We used our own measure of **perceived positive change**, which assessed the degree to which the respondent perceived positive changes in group functioning and performance to have occurred during the past year.

We assessed perceived group performance effectiveness using survey ratings from group members, supervisors, and higher-level managers. The same measure of group performance was used in the employee and supervisory questionnaires. Group members and supervisors rated group performance as highly ineffective to highly effective on quality, productivity, QWL, costs, and safety. A principal components analysis was performed and since this analysis yielded only a single factor, the five items were averaged to form overall measures of **employee and supervisory perceptions/ratings of team performance**. Higher-level managers rated performance in a different way. They rated the groups in the sample against all other groups in their organization that

performed similar work on quality, efficiency, and overall performance. One factor emerged from the principal components analysis, and therefore we used one overall measure of **managerial perceptions/ratings of team performance**. The instructions on the questionnaire encouraged higher-level managers to check performance records before rating the groups, and they were asked to indicate on the questionnaire the sources of data they used to arrive at their rating. Thus, although we measured managers' perceptions of performance, we tried to ensure that their ratings were grounded in performance data.

In general, we were not able to obtain company performance data aggregated at the group level of analysis. The company did not typically track the performance of its teams. In addition, the data that could be obtained were not comparable across different types of teams. However, the company did measure performance for some business units. In a subsample of small business sales offices, we measured unit effectiveness using quality of service data. Each of the nineteen small business offices were either self-managing or not for all teams of employees. Therefore, comparisons could be made at the business office level rather than at the team level. We obtained two measures of customer satisfaction. These were the **number of customer complaints** to the Company President or public regulatory agency **per 100,000 business contacts** and the **percent of customers rating service quality highly** in routine surveys of its customers over a seven-month period.

The company maintained records on the incidence of accidents and the hours and dollars lost through absenteeism for individual employees over an eight-month period. We were able to aggregate this data at the group level for teams in our sample. The company did not identify individual employees on their tracking forms, but instead reported incidents and corresponding dollars lost by work group/team code numbers. We tracked the **incidence of accidents** and **on-the-job illnesses**, and the **hours and dollars lost due to short-term and long-term absenteeism** for the members of the self-managing and traditionally-managed groups. The company did not collect and we were unable to obtain precise data on the number of nonexempt members of work groups. We

therefore assumed that group size in both groups in each pair were the same, because groups that performed the same type of work tended to be the same size. Because both our individual questionnaires and company records were anonymous, we were not able to determine the correspondence between the individuals that responded to our questionnaires and company records.

Table 3 lists number of items, individual and group-level reliabilities, and the means and standard deviations at the group level on the survey measures. To compute group-level reliabilities, we aggregated individual responses to determine a group mean, and used the group means to compute the Cronbach alpha. The measurement properties of these variables generally ranged from good to excellent. The table also presents means and standard deviations for the objective measures of small business office performance, incidence of accidents, and withdrawal behaviors.

Insert Table 3 About Here

We collected several types of data in order to examine whether differential selection and/or mortality offered plausible alternative explanations for any differences between groups. We collected standard demographic data including **age, sex, race, education, and years in the job, work group, and company**. We also collected attitudinal data from employees and supervisors about perceived differences between members of self-managing teams and other employees, including **similarity in technical proficiency** and **willingness to accept responsibility**, whether **self-management would fail without "unusually mature and technically proficient employees,"** and whether or not **"most employees are ready for self-management"**. In addition, we measured perceived group member and supervisory turnover to assess the impact of mortality. If there was a higher turnover rate in the self-managing teams than in the traditional groups, any performance or quality of work life differences might be due to differences in composition. **Perceived member turnover** was measured by a Likert-type scale on the employee survey stating that "there is little turnover of members in our work group"

and "members of our work group change frequently" (group-level alpha =.80). **Perceived group member turnover** was measured on the supervisory survey by asking supervisors to write in the number of group members who left the work group during the last year. **Perceived supervisory turnover** was measured on the supervisor survey by asking how many direct supervisors of this work group left their position.

RESULTS

The findings are organized in four sections. First, we discuss the correlations among the measures of QWL, performance, and behavioral outcomes. Second, we present the results from the analyses comparing self-managing teams to traditionally-managed groups on QWL and performance effectiveness data. Third, we describe findings from the case studies that help to clarify a particular discrepancy in the quantitative results, by describing the nature of work being performed in each of the functions. Finally, we explore rival hypotheses.

Correlations Among Quality of Work Life and Performance Effectiveness Measures

Table 4 shows the correlations among employee QWL outcomes, group performance ratings by employees, supervisors, and higher level managers, safety, and withdrawal behaviors. The QWL

Insert Table 4 About Here

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ratings are highly correlated with one another. The QWL ratings also are highly correlated with employee ratings of group performance. Supervisor ratings of group performance are not correlated with any of the employee QWL ratings or the employee group performance ratings. However, supervisor ratings of performance are correlated with manager ratings of performance. Manager ratings of group performance are correlated with employee-rated group performance and supervisor-rated group performance. Manager group performance ratings also are correlated with growth needs satisfaction and organizational commitment, but not with other employee QWL variables. The

number of work days missed due to on-the-job accidents or illnesses are negatively correlated with job satisfaction, social satisfaction, and organizational commitment. The dollars and hours lost to short-term absenteeism are negatively correlated with job and growth satisfaction and highly correlated with each other. Finally, the dollars and hours lost to long-term absenteeism are correlated with other withdrawal measures.

The intercorrelations among the three ratings of group performance suggest that they may be tapping the same construct. However, they have different patterns of correlations with each other and the QWL variables. Because of these differences, we retained all three group performance measures in later analyses. The measures of safety and withdrawl behaviors are related to QWL outcomes, but they are not correlated with the three group performance measures.

Because of the high intercorrelations among the QWL measures and the employee performance rating, we could have combined them into a higher-level construct. Given the history of these measures in the organizational literature, and this article's focus on the effects of self-managing teams on both employee attitudes and group performance, we chose to include separate analyses of the QWL and performance outcomes. However, we also ran a multivariate one-way analysis of variance (MANOVA) on the employee quality of work life and performance measures as a set. The MANOVA indicated that the self-managing teams were rated higher than the traditional groups on the set of employee outcomes ($F = 5.27$, $p < .001$). Given this finding, we proceeded to run univariate tests on the individual outcome measures.

Quality of Work Life and Performance Effectiveness Outcomes

Self-managing groups are rated higher in quality of work life outcomes than traditionally-managed groups. Dependent (paired samples), one-tailed *t*-tests were used to assess the effectiveness

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Insert Table 5 About Here

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of self-managing groups compared to the matched control groups. Self-managing groups report significantly higher levels of job satisfaction, growth satisfaction, social satisfaction, group satisfaction, and perceptions of positive change. The differences between self-managing teams and traditionally-managed groups are consistent and are statistically significant, although the differences in means are relatively modest. No significant differences exist for organizational commitment.

Ratings of group performance generally favored the self-managing teams. Employee ratings of group performance effectiveness by self-managing teams were significantly higher than employee ratings of group performance by matched traditionally-managed groups. Supervisor ratings were not significantly higher for the self-managing teams. Manager ratings of the performance effectiveness of self-managing groups were significantly higher than their ratings of the matched comparison groups.

The lack of significant differences in supervisory ratings may be explained in part by their lower response rates. In the final sample of matched groups, 32% of the self-managing groups did not have first-line supervisors, and thus could not receive first-line supervisory ratings. In addition, the trend was for self-managing groups without supervisors to be more effective than self-managing groups with supervisors, although the differences were not significant. The mean group performance rating by employees for self-managing teams without first-line supervisors was 5.6 as compared to 5.4 for those with first-line supervisors (t = 1.28, one-tailed probability = .11). The mean group performance rating by higher level managers for self-managing teams without first-line supervisors was 3.8 as compared to 3.6 for those with first-line supervisors (t = .89, one-tailed p. = .19).

We analyzed data listing on-the-job accidents and illnesses for 44 matched pairs of groups. The general pattern indicates no significant differences between the self-managing teams and control groups. Self-managing teams were no more likely than control groups to have at least one accident o on-the-job illness. Twenty-seven pairs had no incidents, while there were three more self-managing teams than control groups that experienced incidents. More total on-the-job accidents and illnesses were observed in the self-managing teams (11 versus 8). However, the differences were not

significant (Fisher's Exact Test 2-tailed probability = 1). We used the Fisher's Exact Test because 25% of the cells had low expected counts (less than 5), and the data are categorical. The number of days of work missed due to on-the-job accidents and illnesses was not significantly different, indicating that serious accidents were no more or less likely in self-managing teams. There were no stress-related on-the-job illnesses in either self-managing team or control groups during this time.

Insert Table 6 About Here

We compared data on data on short-term, unplanned absenteeism (less than seven consecutive days) for 42 matched pairs of groups and data on long-term absenteeism (seven consecutive days or more of absence) for 44 matched pairs of groups. Short-term absenteeism often indicates escape behavior, while long-term absenteeism typically indicates illness. Results of two-tailed paired *t*-tests indicate that there are no significant differences on the the dollar cost of hours lost due to short-term absence, the number of hours of short-term absence, the dollar cost of hours lost due to long-term absence, and the number of hours of long-term absence.

Objective quality of service data from the small business office subsample reveal no significant performance differences. The self-managing business offices did not differ from the traditionally-managed business offices in the number of customer complaints (SM Office Mean = 3.97, Traditional Mean = 3.28, t = 1.14, N=18). However, the base rate of customer complaints was very low and the variance was small (the worst business office had 6 complaints per 100,000 calls, the best had 2 per 100,000 calls). The company's survey data on customer satisfaction also showed no differences between self-managing teams and control groups. There were no differences between the business offices that were self-managed and those managed conventionally in the percentage of customers who rated service highly (SM Mean = 91.13, Traditional Mean = 91.64, t = -.22).

Because there were no differences in the objective performance customer satisfaction measures for the small business office subsample, we made the post-hoc prediction that there would be no differences in the employee, supervisor, and manager survey performance ratings. The differences in employee, supervisor, and manager performance ratings between self-managing and traditionally-managed small business office teams were not statistically significant. The survey findings indicated that self-managing team's were not more effective than traditionally-managed small business office teams. These findings are consistent with the results from the objective quality of service data.

The overall differences in performance ratings were the result of differences between self-managing team's and traditional groups in the craft and clerical subsamples. Table 7 presents the survey group performance results broken down by work function. Employees, supervisors, and managers all rated the performance of clerical and craft self-managing teams higher that they rate

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Insert Table 7 About Here

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traditionally-managed groups, although only the differences in employee ratings achieved statistical significance. The trends were mixed for both small business office groups and management teams.

Case Study Results

The results from the three case studies provide possible explanations for the difference in findings between the small business office subsample and the overall sample. We studied a Sales Development Center, an installation and maintenance crew, and an engineering support clerical group.

Sales Development Centers (SDCs) were responsible for recommending products and services to small business customers. The SDC we studied had seventy employees, comprised of sixty customer service representatives, three order writers, and seven first-line resource managers. The service representatives were organized into seven sections, and each section was defined as a "directed autonomy" team. SDCs began using the term "directed autonomy" instead of self-management to

draw attention to the continuing role of the supervisor. The work was not interdependent. Service representatives answered individual customer calls which were routed automatically by computer to any member of the SDC. The work was not redesigned to give sections responsibility for particular customers or regions. Employees tended to help each other with unusual customer requests, to share information, and to discuss new ideas with other section members, because they sat near one another. Sections set goals and procedures within the constraints of state-wide and office policies and procedures. However, the company set specific standards about both outcomes and procedures to be followed, which limited considerably employees' discretion. Employees gained increased responsibility and influence following adoption of self-managing teams. For example, they could credit a customer's account up to a certain dollar amount without approval from a manager. Overall, employees had some increased discretion, but the work design and technology did not support teamwork, a high level of employee autonomy, or identification with a particular set of customers.

"Outside plant" workers such as the installation and maintenance crew we studied traditionally had a high level of autonomy compared to office workers in the company. They were spread geographically during the course of a work day, and it was impossible for a supervisor to closely monitor the behavior of group members. Each self-managing team crew is responsible for servicing customers within an assigned geographical area. Following a brief daily team meeting, employees worked independently most of the time, although more than one employee was needed on some assignments. Workers in the crew had considerable seniority, skill, and experience, and rarely needed the assistance of a supervisor. Thus, the self-managing team concept fit well with the nature of the work. It also fit with new technology that permitted electronic allocation of work assignments from a central dispatch office directly to the worker. Overall, the self-managing team concept fell on fertile soil in this team because of the nature of the work and technology. It led to a modest increase in employee responsibility and autonomy within the team and increased identification with a set of customers.

The engineering support clerical group we studied was a location records team, responsible for posting engineering and construction jobs to maps which define the location of telephone poles, cables, fiber optics, etc. These records were critical for future customer service and state taxation purposes. This team was located in its own room, physically separated from the other engineering support clerks in the construction and engineering office. Location records clerks were responsible for and made decisions concerning all mapping activities for the forty-four exchange areas covered by this office.

The case studies suggest reasons why no difference in effectiveness between self-managing teams and traditionally managed groups was found for the small business office subsample in contrast to the overall findings. First, the work technology was more amenable to self-managing team designs for some types of groups than others. Self-managing team designs are most appropriate when the work technology creates a high level of interdependence and requires a high level of employee information processing (Cummings & Blumberg, 1987). Interdependence creates the need for teamwork; heavy information processing requirements create the need for employee autonomy or discretion. The work technology required the least teamwork or autonomy in the Sales Development Center. It required slightly more teamwork and much more autonomy in the outside plant group. The work technology demanded a fair amount of both teamwork and autonomy in the engineering support clerks group. Sociotechnical systems theory would suggest that the work technology or at least job characteristics would need to be redesigned in order for the self-managing team concept to be effective in the sales offices. This did not happen.

The cases further suggest the variety of the self-managing team concept as applied in this company. Self-managing teams were different from their traditional counterparts in each case. However, there was variation across the three cases on many key variables, including job characteristics, supervisor's role, customer focus generated by the change, and whether or not

employees volunteered for the self-managing team. Analyses that are beyond the scope of this paper are needed to identify the most important design factors.

Other Analyses: Selection and Mortality Effects

Employees were not randomly assigned to self-managing and traditionally-managed groups. Rival explanations involving selection and mortality challenge the interpretation that differences in effectiveness between self-managing and traditionally-managed groups were caused by the impact of self-management. Assessing the viability of these rival explanations was critical not only to us as researchers, but to the company study team that wanted to make sure its recommendations to top management about diffusing self-management to other parts of the company were well-founded.

A few members of the company study team thought that selection bias could have occurred. If the groups which were already high performers were the ones selected to be self-managing teams, then the findings could be due to a selection bias rather than any effects of self-management. Thus, we collected demographic and attitudinal data and performed multiple analyses to explore this issue.

The demographic data is based upon 982 employees, 52 percent of whom were men. Their average age was 39. 62% have at least some college or technical training beyond high school, 12% have a college degree, and 3% have graduate training. Their average years of service include 15 with the company, 8 years in the current job, and 3 years in the work group. No significant demographic differences existed between members of self-managing teams and traditionally-managed teams. The demographic findings do not support an alternative hypotheses that performance differences are due to selection.

In general, attitudinal data do not support a selection hypothesis. The supervisors of <u>both</u> self-managing groups and traditionally-managed groups believed that the "members of their groups were above average in technical proficiency and willingness to accept responsibility." There were no significant differences between self-managing teams and traditionally-managed groups on this dimension. Most employees and supervisors agreed with the statement that "without unusually mature

and technically proficient employees self-management would fail." The ratings of respondents from self-managing teams and traditionally-managed groups were not significantly different--they both believed that self-management required unusual employees. However, most respondents disagreed with the statement that "employees were not ready for self-management." There are significant differences here, with self-managing team respondents disagreeing more strongly than respondents from traditionally-managed teams.

We collected data on perceived group turnover of employees and supervisors to assess the impact of mortality. If there were strong mortality effects, self-managing teams should have experienced a different level of turnover by employees and supervisors than traditional groups. No significant differences exist between self-managing teams and traditionally-managed teams in the amount of member turnover. Employees of self-managing teams did not evaluate the "amount of turnover" and the frequency to which "members of their work group changed" differently than employees of traditionally-managed groups (self-managing team mean = 5.7, traditional group mean = 5.5, t = .93). The number of group members that "left the work group" reported by supervisors of self-managing teams were no different than reported by supervisors of traditional groups (self-managing team mean = 2.3, traditional mean = 1.7, t = 1.14). Although the trend suggests that slightly more turnover occurred in the self-managing teams, the difference between means was not statistically significant. The findings on member turnover converged using different measures in the employee and supervisory data sets. No significant differences exist between self-managing teams and traditionally-managed groups in the numbers of "direct supervisors who left their positions" as indicated by the results from the supervisory survey (self-managing team mean = 1.3, traditional mean = 1.2, t = .37).

In general, empirical data do not support the conclusion that perceived performance differences between self-managing and traditionally-managed teams were due to selection or mortality. Although the quasi-experimental design does not permit us to fully rule out these alternative explanations, our

analyses do not provide evidence for them. Thus, selection and mortality effects do not threaten the causal interpretation that differences between self-managing and traditionally-managed groups were due to the impact of self-management.

DISCUSSION AND CONCLUSIONS

This study suggests that self-managing groups are more effective than traditionally-managed groups. It extends the findings that self-managing groups result in quality of work life and productivity benefits from manufacturing settings to a variety of work settings.

We found, as have other studies of self-managing teams (Goodman et al., 1988), that there were significant differences in QWL outcomes directly related to the intervention. Thus, members of self-managing teams had higher levels of job satisfaction, growth needs satisfaction, social needs satisfaction, and group satisfaction. Self-managing teams also were higher on perceived positive change in group functioning and performance, suggesting that employees of self-managing teams had perceived their groups as making improvements over the last year more than employees of traditionally-managed groups. The evidence did not support a spillover effect to attitudes about the organization not directly related to the intervention. The self-managing teams were no different on organizational commitment.

Ratings of performance by both members and higher level managers were higher for self-managing teams. Because managers were asked to base their ratings on objective performance data, we believe that this result captures actual performance differences. Some higher-level managers were involved in the decision to establish self-managing teams, which may have influenced their performance evaluations of them. We do not have data on the numbers of managers in the sample that were involved in this decision. However, whether or not a group was self-managing was not identified on the questionnaire. Unless a higher-level manager was directly involved with a particular group, he might not be aware of its self-managing team status. This should mitigate some of the potential bias in the performance ratings by managers.

There were no significant differences in supervisory ratings. It is possible that there is a systematic bias in the supervisory data. Self-managing teams with supervisors tended to be less effective than those without them. This is consistent with the findings of Beekun's (1989) meta-analysis. Thus, ratings of matched pairs of groups with supervisors may bias the results against self-managing teams.

In contrast to the overall findings, both objective quality of service and survey data for customer service offices subsample showed no significant differences. The case studies suggest that self-managing teams were not an effective intervention for these business offices, because the work had not been redesigned to take advantage of greater self-management. The technology had not been set up to permit groups of employees to handle specific geographical areas or specific customer groupings, as in some insurance and financial services organizations. Although self-managing teams were comprised of customer service representatives sitting near one another and sharing group goals, it is likely that team designs were not appropriate given the lack of interdependence in these jobs. Sociotechnical theory (Cummings, 1978; Pasmore, 1988) suggests that technological and job design changes would be required for teams to be effective in this setting. Further research is needed to assess the viability of the self-managing team model to customer sales offices.

Contrary to some managers' hopes, safety and health were not better in self-managing teams. Contrary to some union leaders' fears, these indicators were not significantly worse in self-managing teams. Other research suggests that participation in self-managing teams can improve safety (Walton, 1972; Goodman, 1979). However, in the Goodman study, the organization had placed a great deal of emphasis on improving safety in its overall change strategy. The firm we studied placed no special emphasis on safety in the adoption of self-managing teams. These findings suggest that the establishment of self-managing teams do not automatically improve safety. On the other hand, the results do not support the idea that self-managing teams are a form of "management by stress" that jeopardizes employees' health and safety.

Self-managing teams did not lose more dollars and hours due to short-term and long-term absenteeism than traditional groups. Although most studies have reported reduced absenteeism due to the implementation of self-managing teams (Beekun, 1989; Pasmore et al. (1982), some have reported increased absenteeism (Cordery et al., 1991). The amount of absenteeism was relatively small in this firm, and was not a focus of management attention. These findings suggest that the implementation of self-managing teams do not automatically decrease escape behavior.

The links between these different outcomes are worth noting. Similar to other studies of group effectiveness (Gladstein, 1984), the employee-rated QWL measures and self-reported effectiveness measures were highly correlated. Thus, employees who reported a high quality of work life belonged to groups that they judged to be high performers. It is not possible to determine the direction of causality nor whether the measures were picking up a positive "halo" effect and not distinguishing between QWL and effectiveness. However, this problem is somewhat mitigated by the correlations of the managers' group performance ratings with both supervisor and employee group performance ratings. This may suggest some overlap in the construct being used by employees, supervisors and managers. In contrast to employee-rated performance and manager-rated performance, the supervisor ratings were not at all correlated with employee QWL outcomes. It seems that supervisors are using different criteria to judge performance than either employees or managers. Certainly, other studies have found that different constituencies judge performance using different criteria (Mahoney & Weitzel, 1969). As other studies have found, job, growth, and social satisfaction were negatively related to withdrawal behaviors (Lawler, 1973). This relationship suggests that self-managing teams could reduce absenteeism through improving employee satisfaction. However, the lack of differences between self-managing teams and traditionally-managed groups in the amount of absenteeism suggests that this did not occur.

As with the attitudinal effects, it appears that the strongest and most consistent performance effects of self-managing teams were those closest to the intervention. Overall performance,

productivity, and quality, which were the main goals of the intervention, showed the strongest effects -- at least when the technology was appropriate for self-managing teams. Safety, health, and absenteeism, which were not targets of the intervention, showed no effects. The absence of indirect and spillover effects should not be surprising in light of the overdetermined nature of complex systems. Each type of organizational performance and pattern of behavior has its own determinants. However, this line of reasoning implies that self-managing teams often are oversold by interventionists, who tend to advertise pervasive indirect effects. The effects of self-managing teams appear to be significant, but limited to direct targets of the intervention.

It is possible that systematic differences in personnel selection and turnover between self-managing teams and traditionally-managed groups could have accounted for the findings. However, our analyses provided little evidence to support selection or mortality effects. Most previous studies have not reported on analyses intended to separate out the effects of alternative explanations. The Wall et al. (1985) study found systematic differences in gender composition, length of service, and turnover, but these differences had no impact on their overall findings. The lack of systematic differences in selection and turnover strengthens our causal argument.

These findings have two major implications for theory development. First, most theories of self-management hypothesize favorable impacts on team and organizational effectiveness. For example, sociotechnical theory posits that self-managing teams will contribute to improved effectiveness (e.g. productivity, quality and quality of work life) and does not predict differential impacts depending on the outcomes. We found that positive impacts were limited to certain dimensions of effectiveness, for example, self-managing teams had beneficial impacts on productivity and quality of work life, but not on safety or withdrawal behaviors. This argues for clearly specifying multiple dimensions of team and organizational effectiveness and testing the impact of self-management on each dimension. Without a comprehensive set of outcome measures, it is not possible to test whether self-managing teams have differential impacts on outcomes. The study also raises the related theoretical question of

what design features are related to specific outcomes. Are different outcomes explained by the same predictive model? For example, the factors that contribute to improving safety may not be the same as those that contribute to improving group productivity. The design or implementation of self-managing teams may need to be different if the intended outcome is improved safety as compared to improved productivity. We need more finely grained models that specify the relationship between key design features and outcome criteria. Goodman, Ravlin, & Argote (1986) make a similar argument in their review of the group effectiveness literature.

Second, the study raises the key theoretical question of why self-managing teams are effective for certain outcomes? What are the mechanisms by which they work? Because we found performance and quality of work life differences between self-managing and traditionally-managed teams, further analyses of the factors that contribute to their success are warranted. A later paper will focus on the characteristics that predict self-managing team effectiveness, including employee involvement contextual supports, supervisory supports, group job design features and other characteristics. It will also consider whether self-managing teams are evaluated as higher than traditionally-managed groups on such characteristics.

This study offers a lesson that goes beyond its substantive findings: it illustrates the power of a collaborative research approach (Cummings, Mohrman, Mohrman, & Ledford, 1985). The researchers and clients were co-learners who jointly defined the research questions, research design, and methods. The researchers brought to the project technical expertise concerning prior research on self-managing teams, research design options, instrumentation, and statistical analysis. The client organization, through the management-union study team, insured that the research would address important pragmatic concerns and that it took into account the technical, social, and political realities of the organization. The study team challenged our thinking and helped mold the research to the needs of the organization. In the process, the study team became keenly interested in the success of the research from a scientific standpoint. We cannot imagine that the company would have tolerated

the collection of data from over 100 groups and 1300 individuals if we had used a different approach.

Based on the findings, the study team recommended to top management that the self-management team concept was viable and its diffusion should be encouraged. However, the study team cautioned that it was not applicable to all work situations and local design was critical. It requested help from senior management in changing aspects of the company's infrastructure, for example measurement systems, because organizational systems and practices frequently were obstacles to implementation. The study team also asserted that the self-managing team concept should not be viewed simply as a way of cutting costs. It would require investment, and should be viewed as a way to more fully utilize the creativity and energy of employees. Senior management responded by endorsing the recommendations and appointing a middle level manager to coordinate both "employee involvement" and "total quality" efforts. However, several factors have slowed down wider diffusion of the self-managing team concept. The company has downsized considerably to respond to changing competitive conditions and many of the champions of the self-managing team concept chose an early retirement option. The middle manager appointed to coordinate "employee involvement and total quality" placed his focus on the implementation of total quality and a major training effort was undertaken. The reduction in the company's workforce has led to a renewed interest in the possibilities of using a team design to enable departments to do "more with less." It is too early to tell whether or not a sustained change effort will emerge from this renewed interest.

This study has several major strengths. The sample size is unusually large by the standards of small group research, especially in field settings. The opportunity to use matched control groups in a field setting also was rare. In addition, our multi-trait, multi-method approach provides a fuller picture of the effectiveness of self-managing teams versus traditional groups than would be possible from a more limited measurement of effectiveness. Finally, the diversity of the sample is a major advantage. All of the best prior studies of self-managing teams (e.g., Goodman, 1979; Wall et al., 1986) have been conducted in a single location using a single technology, and an essentially uniform

self-managing team intervention. Our sample is far more diverse. Teams included in the sample performed a wide variety of types of tasks, and were located in urban, rural, and suburban locations throughout a large state. The self-managing team intervention was not tightly controlled, and there were many variations in specific design characteristics of self-managing teams. In many cases, the self-managing team installation process was less than ideal. Thus, our study is a robust test of naturally-occurring self-managing teams, not self-managing teams created under the most favorable possible conditions.

There are three major weaknesses of the study. First, it was impossible to use objective, group-level performance data for all groups in the sample. These diverse groups do not share meaningful performance metrics; productivity and quality mean different things in different groups. Our use of multiple ratings of performance provides some degree of compensation for this flaw.

Second, the lack of a tightly controlled installation of self-managing teams creates problems in inferring that self-managing teams are more effective than traditional groups. Self-managing teams are not one discrete thing in this study. Indeed, a future study will be needed to disentangle which specific design features of self-managing teams are most responsible for increased effectiveness. In essence, this study trades off some degree of internal validity for greater external validity. In this respect, the strengths and weaknesses of this study are opposite those of the best prior studies of self-managing teams.

Third, the research design is cross-sectional rather than longitudinal. This limits the strength of causal inferences. However, the average age of self-managing teams in the sample was approximately two years, indicating that the intervention was mature. This suggests that differences in effectiveness are persistent and that the differences are not caused by a "honeymoon" phenomenon associated with the intervention.

This study suggests that self-managing teams are effective and relatively robust work designs. Their proliferation and diffusion is promising; self-managing teams enhance quality of work life and

performance effectiveness. However, this study also found that self-managing teams do not increase all types of performance effectiveness for all types of work. Further research will need to describe conditions required for the self-managing team work design to be viable and specify limits to its generalizability.

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TABLE 1

Study Samples

(Number in Parentheses are Response Rates)

	Self-Management	Traditional	Total
Number of Groups Selected for Study	85	84	169
Number of Groups From Which Data Was Received	81	82	163
Employees			
Employees Responding	491	516	1044[a]
Groups with Sufficient Data	69 (81%)	69 (82%)	138 (82%)
Final Matched Groups	50 (59%)	50 (60%)	100 (59%)
Supervisors/Managers			
Supervisors/Managers Responding	60	62	142
Groups with Sufficient Data	50 (59%)	57 (68%)	107 (63%)
Final Matched Groups	38 (45%)	38 (45%)	76 (45%)
District/Division Managers			
District/Division Managers Responding	61	61	136
Groups with Sufficient Data	62 (73%)	65 (77%)	127 (75%)
Final Matched Groups	44 (52%)	44 (52%)	88 (52%)
Union Presidents			
Union Presidents Responding	15	N/A	N/A

[a] Totals are greater than sum of self-management and traditional groups because some respondents did not indicate the group in which they are a member.

TABLE 2

Overlap of Groups Among Data Sets

	Groups with Sufficient Data			Final Matched Groups		
	Self Management	Traditional	Total	Self-Management	Traditional	Total
Groups Overlapping Across 3 Data Sets						
Employee, Supervisor, & Manager	36	40	76	12	12	24
Groups Overlapping Across 2 Data Sets						
Employee/Supervisor	6	12	18	7	7	14
Employee/Manager	18	14	32	11	11	22
Supervisor/Manager	5	3	8	3	3	6
Total Groups	29	29	58	21	21	42
No Overlaps						
Employee	9	3	12	20	20	40
Supervisor	3	2	5	16	16	32
Manager	3	8	11	18	18	36
Total Groups	15	13	28	54	54	108

TABLE 3

Effectiveness Measures

	Number of Items	Alpha (Individual Level)	N (Cases)	Alpha (Group Level)	N (Groups)	Mean (Groups)	SD (Groups)
Quality of Work-Life							
Job satisfaction	3	.84	670	.87	100	5.56	.69
Growth satisfaction	4	.86	670	.89	100	4.64	.82
Social satisfaction	3	.78	670	.81	100	5.26	.58
Group satisfaction	3	.85	670	.91	100	5.65	.68
Organizational commitment	5	.79	670	.85	100	4.84	.66
Perceived positive change	6	.88	670	.91	100	4.32	.69
Group Performance Effectiveness							
Employee Rating	5	.84	670	.86	99	5.28	.58
Supervisor Rating	5	.85	89	.84	75	5.46	.85
Manager Rating [a]	3	.90	83	.90	80	3.58	.68
Small Business Office Service Effectiveness [b]							
Customer Complaints per 100,000 calls	na	na	na	na	18	3.59	1.29
% of Customers Rating Service Highly	na	na	na	na	19	91.42	4.8
Safety & Withdrawal Behaviors							
On-the Job Accidents and Illnesses							
Incidents	na	na	na	na	96	.32	.69
Work Days Missed	na	na	na	na	96	1.70	8.41
Stress-related Illnesses	na	na	na	na	96	0	0
Short-term Absenteeism							
Dollars Lost	na	na	na	na	95	2135.60	1827.69
Hours Lost	na	na	na	na	95	145.52	131.09
Long-term Absenteeism							
Dollars Lost	na	na	na	na	92	1706.67	2392.92
Hours Lost	na	na	na	na	92	193.28	284.12

[a] Manager ratings used 5 point Likert-type scales in contrast to employee and supervisor ratings which used 7 point scales.

[b] These measures are at a business unit level and <u>not</u> at the team level. There were a total of 19 small business sales offices in the sample from which we obtained quality of service data.

Table 4

Correlations Among Employee QWL Outcomes, Group Performance Ratings, Safety, and Withdrawal Behaviors

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
QWL OUTCOMES																
1.	Job Satisfaction															
2.	Growth Satisfaction	.72****														
3.	Social Satisfaction	.71****	.70****													
4.	Group Satisfaction	.76****	.56****	.80****												
5.	Organizational Commitment	.72****	.70****	.57****	.52****											
6.	Perceived Positive Change	.44****	.53****	.44****	.43****	.51****										
GROUP PERFORMANCE RATINGS																
7.	Employee Rated Group Performance	.63****	.65****	.60****	.62****	.56****	.43****									
8.	Supervisor-Rated Group Performance	.09	.05	.00	.09	.11	.03	.03								
9.	Manager-Rated Group Performance	.09	.24*	.19	.12	.26*	.12	.39***	.31*							
SAFETY																
10.	# of Accidents/Illness	-.07	-.01	-.13	-.08	.00	-.02	-.12	-.05	.10						
11.	Work-Days Missed	-.23*	-.11	-.22*	-.19	-.22*	-.09	-.15	.05	-.07	.29**					
WITHDRAWAL BEHAVIORS																
Short-Term Absenteeism:																
12.	Dollars Lost	-.20*	-.21*	-.16	-.08	-.06	-.08	-.13	-.08	-.04	.07	.11				
13.	Hours Lost	-.21*	-.21*	-.16	-.08	-.05	-.05	-.13	-.08	.00	.06	.13	.97****			
Long-Term Absenteeism:																
14.	Dollars Lost	-.18	-.19	-.16	-.17	-.09	-.07	-.14	.11	-.08	.06	.46****	.52****	.54****		
15.	Hours Lost	-.14	-.16	-.08	-.12	-.06	-.05	-.13	.15	-.08	.00	.35***	.49****	.52****	.96****	

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

TABLE 5

Team Effectiveness

t-Test Results

Variable	Matched Groups		*t*-Value
	Self-Managing Mean	Traditional Mean	
QWL Outcomes (N=50 Pairs)			
Job Satisfaction	5.7	5.5	1.72*
Growth Satisfaction	5.0	4.3	4.62****
Social Satisfaction	5.4	5.1	2.86**
Group Satisfaction	5.8	5.5	1.96*
Organizational Commitment	4.9	4.8	1.20
Perceived Positive Change in Group	4.5	4.2	1.89*
Performance Effectiveness			
Employee Ratings (N=49 Pairs)	5.5	5.0	4.20****
Supervisor Ratings (N=37 Pairs)	5.4	5.5	-.19
Manager Ratings (N=42 Pairs)	3.7	3.5	2.06*

* $p = .05$
** $p = .01$
**** $p < .001$

TABLE 6

Withdrawal Behaviors

t-Test Results

	Matched Groups		*t*-Value
	Self-Managing Mean	Traditional Mean	
On-the-Job Accidents and Illnesses (N=44 Pairs)			
Work days missed	1.41	2.06	.35
Stress-related illnesses	0	0	NA
Short-term Absenteeism (N=42 Pairs)			
Dollars Lost	2454.57	1824.76	-1.76
Hours Lost	169.17	120.52	-1.97
Long-term Absenteeism (N=44 Pairs)			
Dollars Lost	1506.98	1656.98	.31
Hours Lost	175.45	185.55	.18

TABLE 7

Team Effectiveness
Performance Outcomes by Type of Work

t-Test Results

Type of Work	Matched Groups		*t*-Value
	Self-Managing Mean	Traditional Mean	
Clerical			
Employee Rating (N=5 Pairs)	6.0	5.3	2.14*
Supervisor Rating (N=6 Pairs)	5.9	5.7	.62
Manager Rating (N=10 Pairs)	3.9	3.7	.53
Craft			
Employee Rating (N=26 Pairs)	5.6	5.0	3.91****
Supervisor Rating (N=20 Pairs)	5.4	5.3	.32
Manager Rating (N=21 Pairs)	3.8	3.5	1.20
Customer Sales and Service (Small Business Offices)			
Employee Rating (N=17 Pairs)	5.2	5.0	.90
Supervisor Rating (N=10 Pairs)	5.3	5.7	-.86
Manager Rating (N=10 Pairs)	3.5	3.1	1.03
Management Groups			
Employee Rating (N=2 Pairs)	6.0	5.2	
Supervisor Rating (N=2 Pairs)	4.5	5.2	
Manager Rating (N=2 Pairs)	3.2	3.0	

* $p = .05$
**** $p < .001$