AN EXAMINATION OF THE EFFECTS OF QUALITY CIRCLES ON JOB SATISFACTION IN INDUSTRY

A Thesis

by

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ABSTRACT

AN EXAMINATION OF THE EFFECTS OF QUALITY CIRCLES ON JOB SATISFACTION IN INDUSTRY. (May 1985)

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Although U.S. industry has expressed a substantial amount of interest in quality circles during the last several years, there have been very few empirical studies of the impact that quality circles have on employees. The purpose of the current research was to investigate the relationship between membership in a quality circle and the following six dimensions of job satisfaction: (a) satisfaction with type of work, (b) satisfaction with pay, (c) satisfaction with opportunity for promotions, (d) satisfaction with supervision, (e) satisfaction with co-workers, and (f) general job satisfaction.

Data were collected from 243 employees of three corporations which had quality circle programs. The employees were categorized as either quality circle

members, nonmembers who desired to join a circle, or nonmembers who did not wish to participate in the circle process. Stepwise multiple regression analyses were performed on the data from the total sample and separately for each corporation, resulting in 24 regression equations.

The results indicated that quality circle membership is not the most useful predictor of any facet of job satisfaction. In most cases, the relationship between a dimension of job satisfaction and circle membership was negative. Membership in the category of quality circle nonmembers who wished to participate in a quality circle was the most effective predictor of each of the six facets of job satisfaction, with the correlation being positive for five facets. It appears that the use of quality circle programs to enhance job satisfaction may not be warranted. Additional research using experimental or quasi-experimental methods should be conducted to determine the causal effects of quality circles on organizations and their members.

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A special note of appreciation is due my parents for their love and guidance throughout my life. My accomplishments thus far have been, in a large part, due to their support. During my stay in graduate school, their encouragement was unending.

DEDICATION

To my parents

Dewitt and Jean Hughes

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CHAPTER I

Introduction

In the United States the first quality circles were formed in 1974, and by April 1979 there were 300 quality circles (Bureau of Business Practice, Inc., 1981). From 1979 to 1983 the number of quality circles increased to approximately 25,000 in about 2,500 organizations (Barra, 1983). As can be seen, the growth of quality circles has been amazing and they are gaining worldwide popularity. The acceptance of quality circles by U.S. businesses can be traced to the Japanese "economic invasion," which has caused more U.S. businesses to perceive the threat created by Japanese business (Ingle & Ingle, 1983). Business leaders in the U.S. are realizing that Japan sets the standard for quality in many world markets (Barra, 1983). One of the reasons for Japan's success is their use of participative management generated through quality circles. Subjective statements concerning the benefits and impact of Japanese and American quality circles have proliferated in the literature. However, only a few objective case studies of single organizations have been reported (e.g., Aubrey & Hirsch, 1983; Barra, 1983; Bureau of Business Practice,

1981; Ingle & Ingle, 1983; Moretz, 1982, 1983; Thompson, 1982; Trice, 1982). Consequently, an objective study should be conducted to examine the kinds of effects, if any, quality circles have on employees.

Definition and Characteristics of Quality Circles

There are various definitions of a quality circle, all of which have one underlying theme. One definition of a quality circle is "a group of workers, doing the same or similar work in the same department or work area, who regularly and voluntarily meet (usually once a week on company time) to discuss problems associated with their jobs" (Bureau of Business Practice, Inc., 1981, p. 4). Another definition of a quality circle is "a small group of people, usually six to eight, who voluntarily meet once a week to identify, analyze, and solve different kinds of problems in their work areas" (Ingle & Ingle, 1983, p. 63). Thompson (1982) elaborated upon the above definitions by defining a quality circle as a "small group of employees and their supervisor from the same work area, who voluntarily meet on a regular basis to study quality control and productivity improvement techniques, to apply these techniques to solve work-related problems, to present their solutions to management for approval, and to monitor the implementation of these solutions to ensure that they work" (p. 3).

However, there is a problem with the preceding definition. Although the supervisor is usually a member of the quality circle, this is not a strict requirement because participation is voluntary. At some point in time, the supervisor may decide to become a nonmember (Dewar, 1979; Gryna, 1981; Ingle & Ingle, 1983; Thompson, 1982). Thus, for the purposes of this research, a modification of Thompson's definition will be used: A quality circle is a small group of employees (and usually their supervisor) who either perform similar work or are in the same work area and voluntarily meet on a regular basis to study quality control and productivity improvement techniques, apply these techniques to solve problems in their work area, present their solutions to management for approval, and monitor the implementation of these solutions to ensure that the techniques work.

There appear to be six primary characteristics of quality circles. First, quality circle members, not management, select the problems (Barra, 1983; Dewar, 1979). The problems selected by the members may pertain to any aspect of the work area. For example, the problems discussed may include, but are not limited to, areas such as quality, cost, productivity, morale, safety, and housekeeping.

Second, to enable them to solve problems effectively, quality circle members receive training (Gryna,

1981). The training usually comprises three separate topics. Members are trained in problem-solving techniques such as cause-and-effect analysis, brain storming, Pareto analysis, and flow charts. Members are also trained to effectively present their solutions to management. Last, the rules and policies of quality circle participation and the process of conducting meetings are disseminated to the members.

The third characteristic of a quality circle is that the members may ask nonmembers for assistance. The request for assistance may be made during any stage of the quality circle process. For example, management or technical experts may be requested to give the members advice or information about an area of expertise with which the members are not familiar.

The fourth characteristic of a quality circle is that the agreed upon solution is presented to management for approval. If management approves of the solution, then the members are responsible for monitoring the implementation of the solution.

The fifth characteristic is that the quality circle has a leader. As previously stated, the supervisor usually fulfills the leadership function. However, members may choose to elect a nonmanagement employee, who is a member of the circle, to be the leader. The leader

moderates the discussion and promotes concensus, but does not issue orders or make the final decision.

The sixth characteristic of a quality circle is that circle meetings are attended by a facilitator, who is not a member of the circle. The facilitator is responsible for giving the circle members advice and guidance. In many instances, the facilitator is the circle trainer. Furthermore, facilitators are usually responsible for procuring the materials which are needed for each circle meeting and publicizing quality circle events and projects (Thompson, 1982).

Effects of Quality Circles

There have been many claims concerning the effects and benefits of quality circles. Thompson (1982) states that the tangible benefits of quality circles are a decrease in accidents, lost time, grievances, and tardiness. Other reputed benefits of quality circles are an increase in quality and productivity, and a decrease in scrap, absenteeism, and turnover (Bureau of Business Practice, 1981; Thompson, 1982). Finally, several authors state that quality circles foster better communication within the organization (Barra, 1983; Bureau of Business Practice, 1981; Gryna, 1981; Ingle & Ingle, 1983).

Some of the intangible effects of quality circles are reputed to be a decrease in conflict stemming from

the work environment (Gryna, 1981), an increase in loyalty to the organization (Thompson, 1982), and an increase in employees' respect for supervisors and workers (Barra, 1983; Gryna, 1981). Improvements in behavior, attitudes (Gryna, 1981; Ingle & Ingle, 1983), morale (Bureau of Business Practice, 1981; Thompson, 1982), and job satisfaction (Barra, 1983; Bureau of Business Practice, 1981; Ingle & Ingle, 1983) are other reported effects of quality circles. As Harold Kay (cited in Bureau of Business Practice, 1981, p. 59) stated, "Circles improve everything."

Other references pertaining to the benefits and effects of quality circles abound in the literature. The preceding discussion cites only the most widely referenced effects. Many individuals have ascribed various organizational and individual benefits to quality circles based on their subjective experiences. Individuals should be cautious when reading about the effects ascribed to the existence of a quality circle program because no comprehensive research has been conducted to determine if quality circles promote these effects. A few case studies have been conducted, however.

For example, Barra (1983) describes a successful quality circle program that was conducted at Westinghouse Corporation. By 1959, 50 quality circles had been developed at Westinghouse. The number of quality circles

had grown to 1,800 circles by 1982, with 50 circles being added each month thereafter.

The Westinghouse quality circles have achieved various tangible benefits. For instance, a purchasing quality circle saved Westinghouse approximately $600,000 a year by reducing the amount of materials overshipped by vendors. A manufacturing quality circle reduced the operation cycle time of a deshrinking process, which resulted in $180,000 savings in material and labor each time the procedure was used. Likewise, a field service quality circle invented a new tool which eliminated more than 90% of the emergency service cost.

Barra (1983) states that more intangible than tangible benefits have resulted from the institution of quality circles at Westinghouse. Some of the intangible benefits included an improvement in communication between employees and management, and an improvement in the employees' attitudes and performance during work hours. Furthermore, the employees developed more pride and interest in their work. Finally, morale and team spirit increased, which resulted in an increase in employee productivity.

The best evidence of the improvement in worker morale and communication was provided by the results of a survey which was administered to circle members. The objective of the attitude survey was to ascertain the

effects of quality circles on worker morale. The results indicated that 82% of the respondents derived more enjoyment from their jobs after participating in quality circles. Eighty-eight percent of the circle members spent some of their own time on quality circle issues, and all of the circle members thought that the quality circle program should be continued and expanded to other groups (Barra, 1983).

There appears to be several problems with this study. First, since Barra (1983) does not indicate either the reliability or validity of the survey, it may be concluded that the survey was informal. Second, there was no indication that this was a longitudinal study. Therefore, the reported changes are based on the circle members' ability to recall past events. Last, no comparison group, consisting of individuals who were not circle members, was used in the study. The assumption that the quality circles were solely responsible for the reported improvements in worker morale, attitude, and behavior at Westinghouse is illogical based on the evidence reported by Barra.

Aubrey and Hirsch (1983) report the results of a quality circle program at Continental Illinois National Bank and Trust Company of Chicago. At the time of their report, Continental Bank's quality circle program was two years old and consisted of 150 circles. The

program's objectives were to enhance the job satisfaction, communication, motivation, and personal growth of employees as well as increase productivity and improve the quality of services the bank offered. The tangible and intangible results of the quality circle program indicated that some of the objectives had been realized.

For instance, a few of the tangible results included a total cost savings benefit in excess of $150,000. Of the quality circle projects that were approved by management, 26% increased productivity, 17% improved the physical environment, 34% improved the quality, and 24% contributed to service (Aubrey & Hirsch, 1983). A note worth mentioning is that Aubrey and Hirsch did not define either "improved quality" or "contribution to services."

The intangible benefits of Continental Bank's quality circle program included enhanced interaction, rapport, and communication between employees and management. Circle members' leadership, artistic, and creative abilities were recognized and developed. Through their participation in quality circles, members' job knowledge and insight were increased. These intangible results were reported to have caused improvements in the work force's morale and attitude. In areas where circles were instituted, satisfaction and motivation increased,

which resulted in decreased turnover and absenteeism (Aubrey & Hirsch, 1983).

Aubrey and Hirsch (1983) do not indicate how these intangible results were determined. Although the researchers stated that these effects were observed, they were neither empirically measured nor defined. Consequently, no solid evidence exists to support the assumption that quality circles resulted in the reported intangible benefits at Continental Bank.

A description of the 19 quality circles at Central Piedmont Community College, Charlotte, North Carolina, was reported by Moretz (1983). Most of the circle projects that were implemented pertained to the improvement of student services. One of the projects resulted in freeing $100 per month in underutilized staff time for tutoring and other student services. Other projects resulted in the replacement of learning materials which were poorly reproduced, improvement of the security of test storage and administration, and improvement of the noise level in a specific area of the college.

To determine the quality circle members' perceptions of the circle program, a reaction survey was administered to 50 members and completed in 1982. Members were asked to judge the effect of their work group's use of quality circles. The three categories of judgment were "Better," "No Change," or "Worse."

Seventy-five percent of the members surveyed thought that communication within the group was better, whereas 25% indicated that there was no change in communication. Trust within the group was considered to be better by 63%, worse by 2%, and 37% thought that there was no change. Twenty-eight percent of the survey participants thought that there was better confidence in administration's support, whereas 72% thought that there was no change (Moretz, 1983).

Similar to the previously discussed surveys, no reliability, validity, or statistical evidence was reported to support the conclusions. Furthermore, no comparison groups were utilized. Because of these research deficiencies, it cannot be concluded that the quality circle program contributed to the above improvements.

More recently, empirical research has been conducted to examine the relationship between membership in a quality circle and job satisfaction. To discern the effects of quality circles on the quality of working life, employee performance, and employee attitudes, Zahra (1984a) surveyed 414 employees of three manufacturing organizations. A 22-item survey was used to measure the effect of quality circles on quality of working life, which contained six dimensions: (2) Job Characteristics,

(b) Job Context, (c) Participation and Self-Expression, (d) Teamwork, (e) Integration, and (f) Job Potential.

The results indicated that, since quality circles had been instituted at the organizations, the quality of working life had improved. For instance, approximately 73% of the respondents agreed that, since the quality circle program had been implemented, their responsibilities had become clearer. Four-fifths of the individuals who were surveyed thought that their job had become more interesting, and three-fifths indicated that they had more control over their job since the program had begun. A majority of the employees indicated that management had become more receptive to workers' ideas (62.4%) and aware of workers' problems (72.0%).

The results of a chi-square test revealed that quality circle participants agreed with the statements in the Job Characteristics and Job Potential sections more often than other employees. Zahra (1984a) does not state if the aforementioned differences are significant. Regarding the Integration dimension, the relationship between the expression of positive views and the quality circle membership was significant at an unspecified level. The proportion of positive responses was greater for quality circle members on the Job Context, Teamwork, and Participation and Self-Expression dimensions.

Zahra does not state that a chi-square test was performed on the latter three sections.

In the same study (Zahra, 1984a), the effect of quality circles on employee performance and attitudes was measured with a 22-item survey. The survey was divided into two sections: (a) Benefit to Employee and (b) Benefit to Organization. Although the acceptance level and analytical method are not reported, Zahra states that the association between quality circle membership and positive responses to the statements in the Benefit to Employee section was significant. Also unclear is whether the association was manifested by some or all of the Benefit to Employee items. As evidenced by their responses to the Benefit to Organization items, circle participants perceived an improvement in quality at the organizational level more often than other employees. The researcher did not report which statistical test, if any, was used to determine the latter finding.

Some of the more notable results were that the majority of the employees who were surveyed felt that their performance, job attendance, and commitment to the organization had improved since the quality circles had been implemented. Although a majority of the employees (51.3%) felt that their job satisfaction had improved, 36.2% indicated that it had declined since quality

circles had begun. Zahra (1984a) explained the decline in job satisfaction by stating that the quality circle approach brings about many changes, which may alter the underlying culture in an organization, thereby causing some degree of dissatisfaction.

Caution must be observed when reviewing the results of Zahra's (1984a) study because the surveys' origins, reliabilities, and validities were not reported. Additionally, in some instances the reader cannot determine if an objective, statistical procedure was used to analyze the data. Last, the researcher attempted to document a perceived change in conditions and attitudes by using an ex post facto rather than a longitudinal design. These limitations preclude the acceptance of the study's results as solid proof of the benefits and changes caused by quality circles.

As Mento (1982) has stated, many testimonials and some evidence exists that the implementation of quality circle programs results in higher production, reduced conflict, and improved product quality. However, there is little concrete evidence that indicates that quality circles contribute to an increase in morale and satisfaction (Mento). The previously cited studies involving quality circles have either been observational in nature or have not used statistical procedures and valid instruments. The discussion which follows is focused upon

two instances of empirical research, involving quality circles and their effects, which deserve emphasis in the current study.

In the first study (Zahra, 1984-1985), the relationship between quality circle membership and a variety of attitudes was examined. The sample consisted of 413 employees of a medical center. The subjects completed a questionnaire which was comprised of the following measures: (a) the short form of the Minnesota Satisfaction Questionnaire (Weiss, Dawis, England, & Lofquist, 1967), (b) Organizational Commitment Questionnaire (Porter, Steers, Mowday, & Boulian, 1974), (c) Job Diagnostic Survey (Hackman & Oldham, 1975), (d) Job Involvement (Lodahl & Kejner, 1965), and (e) Role Ambiguity and Role Conflict (Rizzo, House, & Lirtzman, 1970).

The results of the t-test revealed that quality circle members had lower role conflict (M = 30.3) than nonmembers (M = 27.4), t = 2.12, $p < .05$. There was no significant difference between the mean role ambiguity of members (M = 33.8) and nonmembers (M = 33.6), t = .16. The analysis also revealed that there was no significant difference between the motivational potential score of quality circle participants (M = 159.8) and other employees (M = 169.5), t = -.073. Quality circle members were more committed to the company (M = 67.7)

than nonmembers (M = 64.8), t = 2.76, p < .01. Circle participants reported higher levels of job involvement (M = 14.8) than nonparticipants did (M = 15.6), t = -2.13, p < .05. There was no significant difference between members' (M = 75.6) and nonmembers' (M = 75.5) job satisfaction scores, t = .04.

Zahra (1984-1985) states that the lack of significant differences, with regard to job satisfaction, may stem from two sources. First the lengthy procedures involved in identifying and solving problems may foster a sense of helplessness within quality circle participants. Second, as individuals remain in the circle, it may become harder to maintain their interest. If this is the case, then the members may begin to perceive the quality circle process as routinized (Zahra, 1984-1985).

In a second study, Zahra (1984b) examined the quality circle membership-job satisfaction relationship more closely to determine if the lack of significant differences could be attributed to moderating variables. The data were collected from two samples. The first sample, labeled Firm A, consisted of 324 employees of a company which produces metal parts for household furniture. The other sample, Firm B, was composed of 133 employees of a corporation which produces electric equipment for elevators and television sets. Included in a questionnaire, which was completed by the subjects, was the short form

of the Minnesota Satisfaction Questionnaire (Weiss et al., 1967). The results of moderated regression analysis revealed that the relationship between quality circle membership and job satisfaction was not significant at either Firm A (F = 1.71) or Firm B (F = .01).

Rationale for Present Study

The problem. The preceding case studies (e.g., Aubrey & Hirsch, 1983; Barra, 1983; Moretz, 1983) indicate the types of projects which quality circles have completed and, in some instances, the tangible or monetary savings which were accrued as a result of the program. The reader should question the validity of the intangible results reported thus far because they are based upon subjective statements, not empirical evidence. None of the case studies used a valid, reliable instrument or a comparison group. It is uncertain whether the intangible benefits were solely the result of participation in the quality circle program since no comparison groups were utilized.

Two studies (Zahra, 1984b, 1984-1985) do not contain any of the aforementioned methodological flaws. Although the results of these studies indicate that quality circle membership does not effect general job satisfaction, the question remains as to whether or not quality circle membership effects specific areas of job satisfaction. As Zahra (1984b) states, future researchers

should document the relationship between quality circle membership and specific facts of job satisfaction such as supervision, work, or promotion. Possibly, quality circles effect separate aspects of job satisfaction differently (Zahra, 1984b).

The purpose. The present study focused on one of the previously discussed intangible effects of quality circles: job satisfaction. There are two primary reasons for being concerned with job satisfaction. In the first place, job satisfaction can be viewed as a goal in itself. As Locke (1983) states, the happiness which results from job satisfaction may be a goal in life.

In accordance with this line of reasoning, job satisfaction has been found to correlate with several personal outcomes. Job satisfaction may effect other attitudes such as self-confidence (Herzberg, Mausner, & Snyderman, 1959) and general life satisfaction (Iris & Barrett, 1972; Kornhauser, 1965; Weitz, 1952). Job satisfaction has also been correlated with physical health and longevity (Chadwick-Jones, 1969; Herzberg et al., 1959; Palmore, 1969) and mental health (Kornhauser, 1965).

The second reason for being interested in job satisfaction is that it may contribute to other outcomes. This line of reasoning deserved emphasis in the current

study because job satisfaction may lead to other organizational outcomes and may be beneficial to organizations.

To begin with, consistent and significant correlations have been found between the amount of job dissatisfaction, and turnover and absenteeism (Atchison & Lefferts, 1972; Brayfield & Crockett, 1955; Kraut, 1970; Schuh, 1967; Taylor & Weiss, 1972; Vroom, 1964; Waters & Roach, 1971, 1973). However, the correlations between job satisfaction, absenteeism, and turnover have not been high, possibly because there are mediating factors such as financial need, personal commitment to the employer, and the availability of other jobs (Locke, 1983; Steers & Rhodes, 1978).

The relationship between job satisfaction and productivity is unclear. Locke (1983) states that, based on previous research findings, satisfaction and productivity should be considered as separate results of the interaction between the job and employee. Thus, job satisfaction should be expected to cause an increase in productivity only in individual instances (Locke, 1983).

Since quality circles are instituted to increase employee satisfaction (Bureau of Business Practice, 1981), this research is an exploratory study undertaken to discern the effects of quality circle membership on job satisfaction. As previously mentioned, few studies

have included the use of comparison groups and valid, reliable instruments. Furthermore, no previous research has investigated quality circles with regard to several dimensions of job satisfaction. The current research addressed these deficits. Specifically, the present investigation addressed the following questions:

1. Is the group of quality circle members, when compared with nonmembers, more predictive of six facets of job satisfaction? The dimensions of satisfaction examined in this research were general job satisfaction, satisfaction with type of work, satisfaction with pay, satisfaction with opportunity for promotions, satisfaction with superivision, and satisfaction with co-workers.

2. Is the relationship between quality circle membership and job satisfaction positive or negative?

To ascertain the relationship between quality circle membership and job satisfaction, several factors must be controlled. First, satisfaction may be affected by the type of work performed. As a result, survey participants were asked to specify both the department and corporation for which they worked.

Second, two aspects of job satisfaction, pay and promotion, are affected by the length of time an individual has been employed by their current organization. An individual's satisfaction with pay tends to increase as their length of employment increases. Satisfaction

with opportunity for promotion decreases as a function of tenure (Smith, Kendall, & Hulin, 1969). Therefore, subjects were asked to specify the length of their employment. Hereafter, this control variable is referred to as "tenure."

Last, individuals who volunteer to participate in a quality circle may possess high levels of job satisfaction. Thus, the present research employs the use of two comparison groups: (a) nonmembers who do not wish to join a circle and (b) nonmembers who desire to participate in the circle process.

Since one of the reasons organizations implement circle programs is to increase employee job satisfaction, the results of the proposed research should have an impact on organizational policy pertaining to quality circles. Specifically, the present study will have evaluative implications concerning quality circles, thereby enabling corporations to determine if the institution of a quality circle program is a viable method of increasing job satisfaction.

CHAPTER II

Method

Gaining Entry

Three corporations agreed to participate in the current research. The procedure which was followed to gain entry into these corporations contained several steps. Initially, the organizations were contacted by telephone. When calling the corporations, the researcher had to go through a complex tracking process to locate the appropriate respondent. First, when calling organizations which possibly had quality circles, the researcher had to locate an individual in the corporation who knew if the corporation had a quality circle program. If the individual informed the researcher that no circle program existed at that specific corporation, then the researcher ended the telephone contact. If the researcher was told that the corporation had a quality circle program, then the researcher asked the individual which corporate employee was most knowledgable about the program. In all cases, the researcher attempted to locate and make a personal appointment with the person in the corporation who was the most knowledgable about the circle process.

When the appropriate respondent was located, the researcher told him or her that a Master's thesis concerning quality circles was being conducted. Next, the respondent was asked if he or she could be interviewed about the corporation's circle program. If the respondent declined the interview proposal, then no further contacts were made with the organization. If the respondent stated that he or she would participate in a personal interview, then the researcher made an appointment with the individual and interviewed him or her on the corporation's premises. Of the corporations which were contacted by telephone, 18 had quality circle programs. Only one individual declined the interview proposal. Twelve of the individuals who agreed to be interviewed were quality circle facilitators, one was an Industrial Relations Manager, one was a Human Resources Director, one was a Personnel Director, one was a Vice President, and one fulfilled the roles of both Industrial Relations Manager and facilitator.

The initial visit to each of the 17 corporations lasted approximately one hour. The development, implementation, functioning, evaluation, and structure of the corporation's circle program were discussed during each visit. At some corporations the researcher was given written material about the circle program and allowed to examine the circles' meeting rooms, work aids, and

project accomplishments. The researcher observed a quality circle meeting in progress at one organization. At another corporation a slide presentation about its circle program was delivered.

The majority of the individuals gave the researcher the names of other corporations which might be interested in participating in the research. One interviewee was a chapter President of the International Association of Quality Circles (IAQC). During the monthly meeting of the IAQC chapter, the President informed chapter members of the present research and asked them to contact the researcher if they were interested in participating. The researcher received no responses to the IAQC announcement, possibly, due to low attendance.

The researcher determined whether or not the quality circles met the necessary prerequisites for inclusion in the study during the initial visit to the corporations. At one corporation, the circle members neither chose the problem on which to work, determined the cost-benefit effectiveness of the solution, nor implemented and monitored the results of the solution. This corporation was not asked to participate in the current study because, since it lacked the primary characteristics, its inclusion may have biased or confounded the results. A second corporation was eliminated from consideration in the current research because

comparison groups were not available for the quality circles. Another corporation was not asked to participate in the present study because its sample size was too small.

If the corporation met the necessary prerequisites for inclusion, then the interviewee was asked to participate in the current research in return for a presentation of the results. In most cases, the interviewee did not have the power to authorize the administration of a survey. Thus, further visitations with either top executives, personnel managers, or plant managers were required to gain the necessary approval. During the second visitation, the researcher explained the purpose of the present study, use of the final results, and time required to conduct the survey at the corporation.

For various reasons, 11 corporations did not wish to participate in the present research. One interviewee stated that he "knew whether or not his employees were satisfied" and another did not specify exact reasons. Four corporations had either recently completed surveying their employees or were about to begin. At another corporation the researcher was referred to corporate headquarters to receive permission to administer the survey, but the appropriate authority could not be contacted. One corporation agreed to be surveyed and later reversed the decision because they began administering

an in-house survey. Two corporations had formal policies which banned the administration of surveys and one interviewee disliked surveys.

Three corporations, labeled Corporation 1, Corporation 2, and Corporation 3, agreed to participate in the current research and were promised anonymity. Corporations 2 and 3 were located in the same metropolitan area as the researcher. The researcher visited these two corporations a second time to introduce herself to the managers whose employees would be surveyed. Corporation 1 was not visited a second time because it was not located in the same metropolitan area as the researcher. The researcher introduced herself to the supervisors of the potential subjects at Corporation 1 on the day that the survey was administered. In cooperation with the interviewee and supervisors, the researcher determined the date and time of each department's survey.

Setting

The sample consisted of employees from three corporations. Corporation 1, which initiated a quality circle program in July of 1982, is a major weaver and finisher of industrial fabrices. The finished fabric is used in the aerospace, electronics, boating, tooling, recreational, and environmental industries. The plant employs approximately 600 people and has the capacity to produce over 1,000,000 yards of industrial fabric a week.

The corporation's gross annual sales are over $50,000,000.

Corporation 2, which has been operating for 38 years, is a subsidiary of a larger corporation. Corporation 2 consists of two plants which produce two different products. One plant, which did not have quality circles and was not surveyed, is a printing company which specializes in yearbooks. The plant at which the surveys were administered is a photographic finisher. The plants have different peak business seasons, which enables the corporation to transfer employees from one location to the other. During the peak season each plant employs approximately 600 individuals. Approximately 300 people are employed at each plant during the slack business season. Corporation 2's gross annual profits are $25,000,000. In March of 1983 the corporation started its first two circles.

Corporation 3 is a major public utility employing about 30,000 individuals. Twenty-thousand square miles are serviced by Corporation 3. The corporation has approximately 1,360,000 customers and its total sales are nearly $54,000,000,000. The corporation's quality circle program was initiated in September, 1981.

Subjects

Two-hundred-forty-three subjects from three corporations were surveyed. The employees of three

departments, each containing a quality circle, were surveyed at Corporation 1. Hereafter, the departments which were surveyed are labeled Department 1, Department 2, and Department 3.

Five quality circles were in operation at Corporation 2. Two quality circles were not considered for inclusion in the current study because no comparison groups were available. Subsequently, the surveyed departments are referred to as Department 4, Department 5, Department 6, Department 7, and Department 8. Departments 4, 7, and 8, which perform similar work, combined to form one circle.

Due to the size of Corporation 3, which has approximately 70 quality circles, all of the departments which had quality circles could not be surveyed. Departments were chosen according to their proximity to the researcher and ability to complete the survey by a specified date. The subjects consisted of all of the employees working in four departments. These departments were labeled Department 9, Department 10, Department 11, and Department 12.

The sample included both males and females. Participation by employees was voluntary. No remuneration was provided for the employees.

Survey Instrument

The survey was comprised of two parts. Part one was the Job Descriptive Index (JDI) developed by Smith, Kendall, and Hulin (1969). The JDI (see Appendix A) contains five subscales: (a) Satisfaction with Type of Work (18 items), (b) Satisfaction with Pay (9 items), (c) Satisfaction with Opportunity for Promotions (9 items), (d) Satisfaction with Supervision (18 items), and (e) Satisfaction with Co-workers (18 items).

Each of the 72 items is a phrase or an adjective, to which respondents indicate whether it describes the job aspect in question. The response categories are "Yes," "No," and "Uncertain," which are scored 3, 0, and 1, respectively. Thirty-five of the items are negatively worded and, thus, reverse scored. An Overall Job Satisfaction Score is obtained by summing across the five scales.

Numerous reliability and validity studies have been conducted on the JDI (e.g., Hunt, Osborn, & Schuler, 1978; Schriesheim, 1979; Schriesheim, Kinicki, & Schriesheim, 1979; Smith et al., 1969). In 1978, Hunt, Osborn, and Schuler administered the JDI to 395 white-collar and managerial employees. An Overall Job Satisfaction score was calculated and the investigators obtained a Cronbach coefficient alpha of internal reliability of .93. In another study (Schriesheim, 1979;

Schriesheim et al., 1979), 308 managerial and clerical employees of a public utility completed the JDI. An analysis of the data revealed that the Overall Job Satisfaction measure of the JDI had a coefficient alpha internal consistency reliability of .93.

Smith et al. (1969) administered the JDI to 80 male employees from two electronic plants. The results of the research indicated that the Spearman-Brown reliability coefficients were .84, .80, .86, .87, and .88 for the Work, Pay, Promotions, Supervision, and Co-workers subscales, respectively.

Wanous (1974) obtained a correlation of .71 between the JDI Overall Satisfaction score and the short form of the Minnesota Satisfaction Questionnaire (Weiss et al., 1967). The sample for the study included approximately 80 female telephone operators (Wanous, 1974). The relationship between the JDI subscale scores and Lodahl and Kejner's (1965) measure of job involvement were examined in a study of 218 nonsupervisory personnel. The correlations between the job involvement scale and the JDI's subscales were .52 (Work), .33 (Pay), .24 (Promotion), .47 (Supervision), and .29 (Co-workers) (Saal, 1978).

The second part of the survey instrument was devised to ascertain the effects of the control variables on the JDI satisfaction scores (see Appendix B). The

first item asked how many years the respondent had been employed by the corporation for which they worked. Item two asked the subjects to indicate how many years they had been employed during their life. The third item asked the employees if they were a member of a quality circle, and item four asked nonmembers if they would like to join a quality circle. The fifth item asked the subjects to indicate the department for which they worked. This item was not included on all of the surveys because some departments were surveyed on separate days.

Procedure

Approximately one week before the subjects were surveyed, their supervisors distributed a memo in which the purpose and date of the survey were specified (see Appendix C). The supervisors remained to explain the memo and answer questions from the employees.

Due to production requirements at Corporation 1, the employees of a department could not be simultaneously surveyed. Thus, subjects were surveyed during the normal working shift in groups containing approximately five employees. This process continued until all of the participants, who were sent into the survey room by their supervisor, had been surveyed.

The survey was administered by departments at Corporations 2 and 3. The subjects were brought into

the survey room by their supervisor during work hours. The supervisor left the room after introducing the researcher.

At all corporations, the employees were told by the researcher that the survey was being conducted to partially fulfill the requirements of a thesis concerning job satisfaction and quality circles. The subjects were informed that no one, except the researcher, would see the completed surveys. They were also told that management personnel would only be presented with the final results. To ensure anonymity, they were instructed not to put their names on the surveys. The researcher explained how to complete the survey and remained to answer questions. Employees were instructed to place the completed surveys in an envelope, thanked for their participation, and told that they would be informed of the results.

An exception to this procedure occurred with Department 12 at Corporation 3. Department 12's employees were geographically dispersed and the surveys were mailed to the supervisors at each location. The location supervisor distributed the surveys to the employees. Each survey was accompanied by a cover letter stating the purpose of the research and instructions for completing and returning the survey (see Appendix D). The potential participants were asked to complete the survey

within one week and return it, via interoffice mail, in a sealed envelope. The cover letter's instructions were almost identical to the verbal instructions received by other subjects.

Analytical Procedure

Stepwise multiple regression analyses were used to address the research question. The criterion variables were the JDI scores. There were 19 predictor variables.

Three predictor variables were coded as dummy variables and indicated quality circle membership in one of three categories: (a) Member 1 (quality circle members), (b) Member 2 (nonmembers who desired to join a quality circle), and (c) Member 3 (nonmembers who did not wish to join a quality circle). Three predictor variables were coded as dummy variables and indicated whether or not a respondent was employed at each of the three corporations participating in the study. Twelve predictor variables were coded as dummy variables to represent membership in the various departments in the three corporations. Each of the 18 dummy variables was coded as a "1" for nonmembership and a "2" for membership in each category. The last predictor variable was tenure at the employing corporation.

A stepwise multiple regression analysis was performed on the Overall Job Satisfaction score of the total sample, and repeated for the JDI's five subscales.

Due to the differences in the three corporations, each was also analyzed separately. This procedure produced a total of 24 equations. The results of the analyses indicated the percent of variance accounted for in job satisfaction by quality circle membership status, departmental membership, membership in each corporation, and tenure.

CHAPTER III

Results

The results of this research will be presented in the following manner. First, the descriptive statistics relating to each variable are reported. Next, the intercorrelations and the results of the stepwise multiple regression analyses will be given for the data collected from: (a) Corporation 1, (b) Corporation 2, (c) Corporation 3, and (d) the entire sample.

Descriptive Statistics

The descriptive statistics for each variable used in the stepwise multiple regression analyses are presented in Tables 1, 2, 3, and 4. The number of cases for each variable is less than the sample size because only the cases used in the stepwise multiple regression analyses were included. A case was not included if any data were missing from that subject (listwise deletion of cases).

Table 1 shows the means and standard deviations of the JDI scale and subscales for the total sample. The sample in the current study had lower satisfaction scores on each subscale than the JDI's normative-sample

Table 1

Means and Standard Deviations of the JDI Scale and Subscales for the Total Sample

Scale	Mean	Standard Deviation	Number of Cases
Satisfaction with Type of Work	30.193	10.929	233
Satisfaction with Pay	11.432	7.207	234
Satisfaction with Opportunity for Promotions	8.547	8.125	234
Satisfaction with Supervision	38.342	12.666	234
Satisfaction with Co-workers	38.624	12.454	234
Overall Job Satisfaction	127.166	36.031	229

Table 2

Means and Standard Deviations of the Overall Job Satisfaction for Each Membership Group

Membership Status	Mean Overall Job Satisfaction	Standard Deviation	Number of Cases	% of Total Sample
Member 1[1]	123.414	36.045	99	44.3
Member 2[2]	139.682	31.307	44	19.5
Member 3[3]	126.852	36.869	81	35.5

[1]Quality circle member

[2]Nonmember who desires to join a circle

[3]Nonmember who does not want to become a circle member

Table 3

Means and Standard Deviations of the Overall Job Satisfaction for Each Department

Department	Mean	Standard Deviation	Number of Cases	% of Total Sample
Corporation 1:				
Department 1	129.929	25.433	14	5.9
Department 2	123.035	27.267	29	13.1
Department 3	99.167	47.346	12	5.1
Corporation 2:				
Department 4	105.250	25.012	4	1.7
Department 5	98.750	16.680	12	5.1
Department 6	129.900	18.669	10	5.5
Department 7	146.250	48.561	8	3.4
Department 8	152.667	45.837	6	2.5

Table 3 (continued)

Department	Mean	Standard Deviation	Number of Cases	% of Total Sample
Corporation 3:				
Department 9	115.652	31.175	23	9.8
Department 10	122.600	48.474	25	10.6
Department 11	139.429	31.758	49	20.9
Department 12	139.300	35.199	40	18.0

Table 4

Means and Standard Deviations of the Overall Job Satisfaction for Each Corporation

Corporation	Mean	Standard Deviation	Number of Cases	% of Total Sample
Corporation 1	119.582	33.535	55	24.5
Corporation 2	119.324	32.701	37	17.2
Corporation 3	132.329	37.149	137	58.4

(P. C. Smith, personal communication, September 10, 1984) (see Table 5). The greatest difference between the current study's sample and the normative sample occurred on the Satisfaction with Pay subscale.

Table 2 presents the descriptive statistics for the Overall Job Satisfaction of each quality circle membership category. Approximately 44% of the subjects were quality circle members and relatively few nonmembers (19.5%) desired to join a circle. Of the three membership groups, quality circle participants obtained the lowest mean Overall Job Satisfaction score.

The descriptive statistics for each department are summarized in Table 3. One of the smallest departments, Department 8, had the highest mean Overall Job Satisfaction ($\underline{M}$ = 152.67). Department 5 obtained the lowest score, which was 98.75.

Table 4 shows the mean and standard deviation of the overall Job Satisfaction score for each corporation. Corporation 3 had the highest mean Overall Job Satisfaction score, which equalled 132.33. The means for Corporations 1 and 2 were similar ($\underline{M}$ = 119.0).

The mean length of time that the subjects had been employed at their current corporation was 8.987 years. Regarding the length of employment, or tenure, the standard deviation and number of cases were 8.335 and 227, respectively.

Table 5

Distribution Statistics for the JDI[1]

Scale	Mean	Standard Deviation	Approximate Number of Cases
Satisfaction with Type of Work	36.37	10.39	2600
Satisfaction with Pay[2]	29.41	14.35	2600
Satisfaction with Opportunity for Promotions[2]	21.01	15.33	2600
Satisfaction with Supervision	41.11	15.22	2600
Satisfaction with Co-workers	43.15	10.16	2600

[1]Computed from Tables 4.8 and 4.9 in Smith et al., 1969 (P. C. Smith, personal communication, September 10, 1984).

[2]Scores doubled.

Results for Corporation 1

Table 6 presents the correlation matrix for the JDI scales and the variables which were used to predict the job satisfaction calculated from the data collected at Corporation 1. The strongest correlation between a quality circle membership group and tenure occurred with Member 2 (r = -.310). The strongest correlation between tenure and departmental membership was found with Department 3 (r = .481).

Variables which were entered into the regression analysis of Satisfaction with Type of Work were Member 1, Member 2, Tenure, Department 1, and Department 2 (see Table 7). All of the variables, except Department 2, were significant at the $p < .05$ level. Approximately 22% of the variance was accounted for by the variables and a multiple R of .466 was obtained (N.S.). Two variables, Member 3 and Department 3, were not entered into the regression equation.

The Member 1, Member 2, Tenure, and Department 1 variables accounted for about 8% of the variance of Satisfaction with Pay (see Table 8). A multiple R of .286 was obtained. Neither the multiple R nor the variables' regression coefficients were significant. The variables which did not enter into the equation were Member 3, Department 2, and Department 3.

Table 6

Intercorrelations Among the JDI Scale and Variables to Predict Job Satisfaction at Corporation 1

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Work	---	.395	.398	.340	.385	.743	.222	.381	-.071	-.349	-.083	.033	.054
2.	Pay		---	.426	.376	.236	.633	-.231	-.038	.216	-.126	.031	.067	-.122
3.	Promotions			---	.387	.152	.642	-.073	.157	.089	-.235	-.078	.160	-.118
4.	Supervision				---	.327	.732	-.124	-.149	.094	.086	.282	.018	-.349
5.	Co-workers					---	.667	.177	-.165	-.103	.254	.401	-.293	-.082
6.	Overall						---	.028	.044	.037	-.075	.196	-.034	-.184
7.	Tenure							---	.164	-.310	.064	-.278	-.122	.481
8.	Member 1								---	-.439	-.723	-.416	.288	.106
9.	Member 2									---	-.304	.157	.014	-.200
10	Member 3										---	.320	-.316	.041
11.	Department 1											---	-.674	-.280
12.	Department 2												---	-.520
13.	Department 3													---

Table 7

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Type of Work at Corporation 1

Variables	R	R^2	Change in R^2	r	Beta
Member 1	.381	.145	.145*	.381	.490*
Tenure	.414	.171	.026*	.222	.266*
Member 2	.442	.196	.024*	-.071	.194*
Department 1	.464	.215	.020*	-.083	.203*
Department 2	.466	.217	.002	.033	.058

Multiple R = .466; Standard Error = 9.669; F = 2.158 (N.S.)

*p < .05

Table 8

Summary of Results of Stepwise Multiple Regression Analysis of Variables of Predict Satisfaction with Pay at Corporation 1

Variables	R	R^2	Change in R^2	4	Beta
Tenure	.231	.053	.053	-.231	-.190
Member 2	.276	.076	.023	.216	.190
Member 1	.285	.081	.005	-.038	.067
Department 1	.286	.082	.001	.031	-.024

Multiple R = .286; Standard Error = 6.219; F = .889 (N.S.)

With Satisfaction with Opportunity for Promotions as the criterion variable, the multiple R of .262 did not reach significance (see Table 9). Member 3, Department 2, and Department 3 accounted for approximately 7% of the variance. None of the variables yielded significant regression coefficients. Member 1, Member 2, Tenure, and Department 1 did not enter into the regression equation.

Seventeen percent of the variance of Satisfaction with Supervision was accounted for by Member 1, Tenure, Department 1, and Department 3 (see Table 10). The regression coefficients for Department 1 and Department 3 were significant ($p < .05$). Member 1 and Tenure did not yield significant regression coefficients. The multiple R was .409 (N.S.). The variables which did not enter into the regression analysis were Member 2, Member 3, and Department 2.

Member 2, Member 3, Tenure, Department 1, and Department 2 accounted for about 28% of the variance of Satisfaction with Co-workers (see Table 11). Tenure, Department 1, and Department 2 had regression coefficients significant at the $p < .01$ level, and the regression coefficients for Member 2 and Member 3 were significant at the $p < .05$ level. The multiple R was .525 ($p < .05$). Neither Member 1 nor Department 3 entered into the regression analysis.

Table 9

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Opportunity for Promotions at Corporation 1

Variables	R	R^2	Change in R^2	r	Beta
Member 3	.235	.055	.055	-.235	-.216
Department 3	.259	.067	.012	-.118	-.085
Department 2	.262	.068	.002	.160	.048

Multiple R = .262; Standard Error = 8.058; F = 1.003 (N.S.)

Table 10

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Supervision at Corporation 1

Variables	R	R^2	Change in R^2	r	Beta
Department 3	.349	.122	.122*	-.349	-.338*
Department 1	.398	.159	.037*	.282	.195*
Tenure	.407	.166	.007	-.124	.101
Member 1	.409	.168	.002	-.149	-.049

Multiple R = .409; Standard Error = 10.592; F = 2.014 (N.S.)

*p < .05

Table 11

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Co-workers at Corporation 1

Variables	R	R^2	Change in R^2	r	Beta
Department 1	.401	.161	.161**	.401	.605**
Tenure	.501	.251	.090**	.177	.340**
Department 2	.513	.263	.012**	-.293	.180**
Member 2	.521	.272	.009*	-.103	-.073*
Member 3	.525	.276	.004*	.254	.074*

Multiple R = .525; Standard Error = 10.236; F = 2.972 ($p < .05$)

*$p < .05$

**$p < .01$

Table 12 depicts the results of the stepwise multiple regression analysis of the variables used to predict Overall Job Satisfaction at Corporation 1. The variables which entered into the equation were Member 1, Member 3, Tenure, Department 1, and Department 2. These variables accounted for approximately 11% of the variance and the multiple R was .324 (N.S.). None of the variables had significant regression coefficients. Neither Member 2 nor Department 3 entered into the analysis of Overall Job Satisfaction.

The predictor variables were not able to account for a large percentage of the variance of job satisfaction at Corporation 1. A quality circle membership group variable only significantly predicted job satisfaction four times, compared to a possible 18 times. Membership in a quality circle was not a significant predictor of job satisfaction at Corporation 1 except in one instance: Satisfaction with Type of Work. Member 2 was a significant predictor for the Work and Co-workers scales. Member 3 significantly predicted the scores for Satisfaction with Co-workers, which was the scale for which the largest amount of variance was accounted.

Results for Corporation 2

The correlation matrix for the JDI scales and variables used to predict the job satisfaction

Table 12

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Overall Job Satisfaction at Corporation 1

Variables	R	R^2	Change in R^2	r	Beta
Department 1	.196	.039	.039	.196	.494
Member 3	.245	.060	.021	-.075	-.126
Department 2	.270	.073	.013	-.034	.270
Tenure	.323	.104	.031	.028	.199
Member 1	.324	.105	.001	.044	.048

Multiple R = .324; Standard Error = 32.544; F = .917 (N.S.)

calculated from the data collected at Corporation 2 is shown on Table 13. The strongest correlation between the two control variables, tenure and departmental membership, occurred with Department 6 (r = .715). The strongest correlation between tenure and a quality circle membership group was -.416 (Member 2).

All of the variables, except Member 1, entered into the regression analysis of Satisfaction with Type of Work (see Table 14). Department 5 and Department 8 had significant regression coefficients at the $p < .01$ level. The variables which had regression coefficients significant at the $p < .05$ level were Tenure, Department 4, Department 6, and Department 7. The regression coefficients for Member 2 and Member 3 did not reach significance. The variables which entered into the equation accounted for 36% of the variance in Satisfaction with Type of Work. A multiple R of .601 was obtained (N.S.).

With Satisfaction with Pay as the criterion variable, the only variable which did not enter into the equation was Member 1 (see Table 15). About 63% of the variance was accounted for by the variables, which yielded significant regression coefficients ($p < .01$). The multiple R of .794 was significant at the $p < .01$ level.

Table 13

Intercorrelation Among the JDI Scale and Variables to Predict Job Satisfaction at Corporation 2

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Work	---	.496	.474	.250	-.019	.615	.109	-.018	.166	-.103	.000	-.478	.071	.359	.338
2.	Pay		---	.507	.354	-.141	.567	-.180	-.145	.323	-.087	.137	-.458	-.124	.545	.461
3.	Promotions			---	.506	.318	.809	-.140	-.222	.419	-.077	-.198	-.303	-.110	.545	.588
4.	Supervision				---	.233	.767	-.002	-.176	.328	-.058	.146	-.329	.317	.108	.044
5.	Co-workers					---	.510	.012	-.109	-.096	.182	-.604	.160	.164	.072	.238
6.	Overall						---	-.032	-.200	.313	-.023	-.184	-.387	.164	.419	.441
7.	Tenure							---	.275	-.416	.021	-.253	-.206	.715	-.186	-.443
8.	Member 1								---	-.392	-.742	.022	.102	.038	-.245	-.127
9.	Member 2									---	-.327	.364	-.249	-.268	.161	.461
10.	Member 3										---	-.287	.077	.156	.134	-.206
11.	Department 4											---	-.219	-.236	-.203	-.169
12.	Department 5												---	-.387	-.333	-.278
13.	Department 6													---	-.358	-.299
14.	Department 7														---	.289
15.	Department 8															---

Table 14

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Type of Work at Corporation 2

Variables	R	R^2	Change in R^2	r	Beta
Department 5	.478	.229	.229**	-.478	.005**
Department 8	.524	.275	.046**	.338	.496**
Department 7	.551	.303	.029*	.359	.434*
Tenure	.581	.337	.034*	.109	.306*
Department 4	.595	.354	.017*	.000	.319*
Department 6	.599	.358	.004*	.071	.218*
Member 2	.600	.360	.002	.166	-.073
Member 3	.601	.361	.001	-.103	-.032

Multiple R = .601; Standard Error = 9.354; F = 1.766 (N.S.)

*p < .05

**p < .01

Table 15

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Pay at Corporation 2

Variables	*R*	R^2	Change in R^2	*r*	Beta
Department 7	.545	.297	.297**	.545	1.087**
Department 8	.630	.397	.100**	.461	.856**
Department 4	.695	.483	.086**	.137	.929**
Department 6	.749	.560	.078**	-.124	.940**
Department 5	.784	.615	.055**	-.458	.679**
Member 2	.793	.628	.014**	.323	-.162**
Member 3	.794	.631	.002**	-.087	-.043**
Tenure	.794	.631	.001**	-.180	.037**

Multiple *R* = .794; Standard Error = 4.678; *F* = 5.344 (*p* < .01)

**$p < .01$

Approximately 64% of the variance in Satisfaction with Opportunity for Promotions was accounted for by Member 2, Member 3, Tenure, Department 4, Department 5, Department 6, Department 7, and Department 8 (see Table 16). Significant at the $p < .01$ level were the regression coefficients for all of the variables except Member 1, which did not enter into the equation. Also significant at the $p < .01$ level was the multiple R of .799.

All of the variables, except Member 1, entered into the regression analysis of Satisfaction with Supervision at Corporation 2 (see Table 17). Department 6 and Department 7 had regression coefficients significant at the $p < .05$ level. The regression coefficients for Member 3, Tenure, Department 4, and Department 8 reached significance at the $p < .01$ level. The regression coefficients for Member 2 and Department 5 were not significant. The appearance of Department 5 and Member 2 as the best predictors may not be warranted since, after the other variables were entered, their regression coefficients were no longer significant (this is an issue discussed further in Cohen & Cohen, 1975). The variables accounted for about 52% of the variance and a multiple R of .720 was obtained ($p < .01$).

Table 16

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Opportunity for Promotions at Corporation 2

Variables	R	R^2	Change in R^2	r	Beta
Department 8	.588	.345	.345**	.588	.762**
Department 7	.706	.499	.154**	.545	.862**
Department 6	.732	.536	.038**	-.110	.696**
Member 2	.755	.571	.034**	.419	.199**
Department 5	.777	.603	.033**	-.303	.632**
Department 4	.790	.625	.022**	-.198	.371**
Tenure	.798	.637	.012**	-.140	.167**
Member 3	.799	.638	.001**	-.077	-.026**

Multiple R = .799; Standard Error = 5.299; F = 5.496 (p < .01)

**p < .01

Table 17

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Supervision at Corporation 2

Variable	R	R^2	Change in R^2	r	Beta
Department 5	.329	.108	.108	-.329	.782
Member 2	.416	.173	.064	.328	.192
Department 6	.536	.288	.115*	.317	1.547*
Department 7	.576	.332	.045*	.108	.896*
Department 4	.639	.409	.077**	.146	.701**
Tenure	.689	.475	.066**	-.002	-.391**
Department 8	.709	.502	.027**	.044	.291**
Member 3	.720	.518	.015**	-.058	-.148**

Multiple R = .720; Standard Error = 10.900; F = 3.354 (p < .01)

*p < .05

**p < .01

The only variables which did not enter into the regression analysis of Satisfaction with Co-workers were Member 1 and Member 3 (see Table 18). Variables which had regression coefficients significant at the $p < .01$ level were Member 2, Tenure, Department 4, Department 5, and Department 6. Department 7 and Department 8 yielded significant regression coefficients at the $p < .05$ level. Approximately 45% of the variance was accounted for and the multiple R of .673 reached significance at the $p < .05$ level.

Table 19 depicts the results of the stepwise multiple regression analysis of the variables which were used to predict Overall Job Satisfaction at Corporation 2. All of the variables, except Member 1, predicted Overall Job Satisfaction and had significant regression coefficients ($p < .01$). Fifty-nine percent of the variance was accounted for and a multiple R of .768 was obtained ($p < .01$).

The predictor variables were able to account for a fairly large percentage of the variance of job satisfaction at Corporation 2. The departmental variables were very predictive of job satisfaction at Corporation 2. A quality circle membership group variable significantly predicted job satisfaction eight times at Corporation 2. Membership in a quality circle was never a significant predictor of a facet of job satisfaction.

Table 18

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Co-workers at Corporation 2

Variables	R	R^2	Change in R^2	r	Beta
Department 4	.604	.365	.365**	-.604	-.340**
Tenure	.621	.386	.021**	.012	-.215**
Department 6	.645	.416	.030**	.164	.582**
Member 2	.649	.421	.006**	-.096	.027**
Department 5	.655	.429	.008**	.160	.432**
Department 8	.664	.441	.012*	.238	.302*
Department 7	.673	.452	.012*	.072	.224*

Multiple R = .673; Standard Error = 10.316; F = 3.068 (p < .05)

*p < .05

**p < .01

Table 19

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Overall Job Satisfaction at Corporation 2

Variables	R	R^2	Change in R^2	r	Beta
Department 8	.441	.195	.195**	.441	.737**
Department 6	.539	.290	.096**	.164	1.275**
Department 7	.681	.463	.173**	.419	1.007**
Member 2	.704	.495	.032**	.313	.081**
Department 5	.722	.521	.025**	-.387	.771**
Department 4	.764	.584	.063**	-.184	.536**
Member 3	.766	.587	.003**	-.023	-.083**
Tenure	.768	.590	.003**	-.032	-.100**

Multiple R = .768; Standard Error = 24.313; F = 4.496 (p < .01)

**p < .01

Both categories of nonmembers significantly predicted job satisfaction on four occasions. Member 2 was a significant predictor for the Pay, Promotions, Co-workers, and Overall satisfaction scales. Satisfaction with Pay, Promotions, Supervision, and Overall Job Satisfaction was significantly predicted by Member 3.

Results for Corporation 3

The correlation matrix for the criterion and predictor variables, which were used in the analysis of job satisfaction calculated from the data collected at Corporation 3, are presented in Table 20. The strongest correlation between tenure and a quality circle membership variable was .164 (Member 3). The strongest correlation between the two control variables, tenure and departmental membership, occurred with Department 11 ($r = -.254$).

The variables which entered into the analysis of Satisfaction with Type of Work were Member 2, Member 3, Tenure, Department 11, and Department 12 (see Table 21). The regression coefficient for Tenure was significant at the $p < .01$ level. The remaining variables' regression coefficients reached significance at the $p < .05$ level. About 9% of the variance was accounted for by the variables. A multiple R of .295 was obtained ($p < .05$).

Table 20

Intercorrelations Among the JDI Scale and Variables to Predict Job Satisfaction at Corporation 3

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Work	---	.425	.501	.500	.489	.809	.118	-.040	.120	-.059	-.110	-.088	.225	-.067
2. Pay		---	.390	.241	.353	.587	.016	.035	.058	-.084	-.376	-.075	.265	.104
3. Promotions			---	.412	.375	.695	-.089	-.179	.151	.056	-.360	.040	.115	.149
4. Supervision				---	.447	.755	-.007	-.142	.095	.065	.015	.002	-.069	.056
5. Co-workers					---	.772	.087	-.051	.095	-.027	-.114	-.298	.136	.200
6. Overall						---	.046	-.107	.141	-.009	-.211	-.131	.163	.117
7. Tenure							---	-.134	-.034	.164	.035	.079	-.254	.167
8. Member 1								---	-.429	-.660	-.025	.035	-.099	.094
9. Member 2									---	-.396	-.087	-.078	.338	-.211
10. Member 3										---	.097	.029	-.180	.080
11. Department 9											---	-.215	-.337	-.313
12. Department 10												---	-.328	-.305
13. Department 11													---	-.476
14. Department 12														---

Table 21

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Type of Work at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Department 11	.225	.051	.051*	.225	.278*
Tenure	.289	.084	.033**	.118	.187**
Member 3	.292	.085	.002*	-.059	-.032*
Department 12	.294	.086	.001*	-.067	.042*
Member 2	.295	.087	.001*	.120	.029*

Multiple R = .295; Standard Error = 11.136; F = 2.307 ($p < .05$)

*$p < .05$

**$p < .01$

The results of the stepwise multiple regression analysis performed on Satisfaction with Pay, which are displayed in Table 22, indicate that the multiple R of .426 reached significance ($p < .01$). Approximately 18% of the variance was accounted for by the following variables: (a) Member 1, (b) Tenure, (c) Department 9, (d) Department 10, and (e) Department 11. The variables' regression coefficients were significant at the $p < .01$ level.

About 18% of the variance of Opportunity for Promotions was accounted for by Member 1, Member 2, Tenure, Department 9, Department 10, and Department 12 (see Table 23). The variables' regression coefficients reached significance ($p < .01$). A multiple R of .429 was attained ($p < .01$). The variables which did not enter into the regression analysis were Member 3 and Department 11.

With Satisfaction with Supervision as the criterion variable, the predictor variables which entered into the regression equation were Member 1, Member 2, Tenure, Department 11, and Department 12 (see Table 24). Neither the multiple R of .190 nor the variables' regression coefficients were significant. The amount of variance which was accounted for by the variables was approximately 4%.

Table 22

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Pay at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Department 9	.376	.142	.142**	-.376	-.359**
Department 10	.409	.167	.025**	-.075	-.117**
Department 11	.418	.174	.007**	.265	.131**
Tenure	.423	.179	.004**	.016	.078**
Member 1	.426	.182	.003**	.035	.054**

Multiple R = 426; Standard Error = 6.291; F = 5.369 ($p < .01$)

**$p < .01$

Table 23

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Opportunity for Promotions at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Department 9	.360	.129	.129**	-.360	-.314**
Member 1	.406	.165	.035**	-.179	-.186**
Tenure	.418	.175	.010**	-.089	-.121**
Department 12	.426	.181	.006**	.149	.111**
Member 2	.429	.184	.003**	.151	.065**
Department 10	.429	.184	.001**	.040	.027**

Multiple R = .429; Standard Error = 7.648; F = 4.518 (p < .01)

**p < .01

Table 24

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Supervision at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Member 1	.142	.020	.020	-.142	-.129
Department 11	.165	.027	.007	-.069	-.101
Member 2	.179	.032	.005	.095	.082
Tenure	.186	.034	.003	-.007	-.055
Department 12	.190	.036	.002	.056	.047

Multiple R = .190; Standard Error = 12.355; F = .907 (N.S.)

Table 25 shows the results of the stepwise multiple regression analysis of the data pertaining to Satisfaction with Co-workers. The variables which entered into the analysis were Member 2, Tenure, Department 9, Department 10, and Department 12. The variables' regression coefficients and the multiple R of .375 were significant at the $p < .01$ level. Fourteen percent of the variance of the criterion variable was accounted for by the predictor variables.

Regarding Overall Job Satisfaction at Corporation 3, Member 1, Member 2, Tenure, Department 9, and Department 10 were the variables which entered into the regression analysis (see Table 26). The regression coefficients of Member 1 and Department 10 reached the $p < .01$ level of significance. The remaining variables were significant at the $p < .05$ level. Three variables, Member 3, Department 11, and Department 12, were not entered into the equation.

A quality circle membership group significantly predicted job satisfaction at Corporation 3 on eight occasions. Member 1 was a significant predictor of job satisfaction for three scales, which were the Pay, Promotions, and Overall satisfaction measures. In four instances, on the Work, Promotions, Co-workers, and Overall satisfaction scales, Member 2 was a significant

Table 25

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Co-workers at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Department 10	.298	.089	.089**	-.298	-.324**
Department 9	.349	.122	.033**	-.114	-.168**
Tenure	.369	.137	.015**	.087	.114**
Member 2	.374	.140	.003**	.095	.068**
Department 12	.375	.141	.001**	.200	.044**

Multiple R = .375; Standard Error = 12.198; F = 3.965 (p < .01)

**p < .01

Table 26

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Overall Job Satisfaction at Corporation 3

Variables	R	R^2	Change in R^2	r	Beta
Department 9	.211	.045	.045*	-.211	-.247*
Department 10	.278	.077	.033**	-.131	-.180**
Member 1	.298	.089	.012**	-.107	-.064**
Member 2	.305	.093	.004*	.141	.081*
Tenure	.311	.097	.004*	.046	.063*

Multiple R = .311; Standard Error = 37.082; F = 2.597 ($p < .05$)

**$p < .01$

predictor. Member 3 was only a significant predictor of Work Satisfaction.

Results for the Total Sample

Table 27 presents the correlation matrix for the JDI scales and the variables used to predict the job satisfaction calculated from the data obtained from the total sample. The most notable correlation of two control variables, which equalled .320, occurred between tenure and Corporation 1. The strongest correlation which existed between a circle membership variable and tenure was -.155 (Member 2).

The variables which entered into the stepwise multiple regression analysis of Satisfaction with Type of Work were Member 2, Member 3, Tenure, Corporation 1, and Corporation 2 (see Table 28). The variables' regression coefficients and the multiple R of .290 were significant ($p < .01$). About 8% of the variance was accounted for by the variables.

Member 2, Member 3, Tenure, Corporation 2, and Corporation 3 were the variables which entered into the analysis of the total sample's Satisfaction with Pay (see Table 29). Eighteen percent of the variance was accounted for by the variables, which had regression coefficients significant at the $p < .01$ level. A multiple R of .425 was attained. Neither Member 1 nor Corporation 1 were entered into the regression equation.

Table 27

Intercorrelations Among the JDI Scale and Variables to Predict Job Satisfaction of Total Sample

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Work	---	.396	.419	.408	.388	.754	.055	.037	.092	-.111	-.207	.095	.102
2. Pay		---	.398	.320	.214	.593	-.102	-.043	.146	-.073	-.149	-.328	.379
3. Promotions			---	.423	.295	.680	-.033	-.104	.173	-.032	.145	-.162	.002
4. Supervision				---	.371	.753	-.039	-.156	.142	.048	-.033	-.140	.136
5. Co-workers					---	.698	.078	-.089	.031	.068	-.048	.081	-.021
6. Overall						---	.003	-.105	.155	-.017	-.089	-.093	.146
7. Tenure							---	.029	-.155	.095	.320	-.107	-.189
8. Member 1								---	-.429	-.689	.063	.031	-.076
9. Member 2									---	-.359	-.037	-.046	.067
10. Member 3										---	-.035	.006	.025
11. Corporation 1											---	-.236	-.665
12. Corporation 2												---	-.569
13. Corporation 3													---

Table 28

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Type of Work of Total Sample

Variables	R	R^2	Change in R^2	r	Beta
Corporation 1	.207	.043	.043**	-.207	-.247**
Tenure	.244	.059	.017**	.055	.162**
Member 3	.278	.077	.018**	-.111	-.110**
Member 2	.285	.081	.004**	.092	.071**
Corporation 2	.290	.084	.003**	.095	.058**

Multiple R = .290; Standard Error = 10.856; F = 3.718 (p < .01)

**p < .01

Table 29

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Pay of Total Sample

Variables	R	R^2	Change in R^2	r	Beta
Corporation 3	.379	.143	.143**	.379	.260**
Corporation 2	.403	.162	.019**	-.328	-.181**
Member 2	.420	.176	.014**	.146	.098**
Tenure	.423	.179	.003**	-.102	-.054**
Member 3	.425	.180	.001**	-.073	-.038**

Multiple R = .425; Standard Error = 6.626; F = 8.893 (p < .01)

**p < .01

Member 1, Member 2, Tenure, Corporation 1, and Corporation 2 accounted for approximately 7% of the variance of Satisfaction with Opportunity for Promotions (see Table 30). The regression coefficient for Member 2 was significant at the $p < .05$ level. The remaining variables had significant regression coefficients at the $p < .01$ level. The multiple R was .271 ($p < .01$).

Table 31 shows the results of the analysis of Satisfaction with Supervision. About 5% of the variance was accounted for by Member 1, Member 2, Tenure, Corporation 2, and Corporation 3. With the exception of Tenure, the variables had significant regression coefficients ($p < .05$). The multiple R of .229 did not reach significance.

The variables which entered into the regression analysis of Satisfaction with Co-workers were Member 1, Member 2, Tenure, Corporation 2, and Corporation 3 (see Table 32). Approximately 3% of the variance was accounted for by the variables, which did not have significant regression coefficients. A multiple R of .161 was obtained (N.S.).

Table 33 presents the results of the stepwise multiple regression analysis of Overall Job Satisfaction. About 5% of the variance was accounted for by the following variables: (a) Member 1, (b) Member 2,

Table 30

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Opportunity for Promotions of Total Sample

Variable	R	R^2	Change in R^2	r	Beta
Member 2	.173	.030	.030*	.173	.142*
Corporation 2	.232	.054	.024**	-.162	-.127**
Corporation 1	.260	.068	.014**	.145	.145**
Tenure	.268	.072	.004**	-.033	-.069**
Member 1	.271	.073	.002**	-.104	-.046**

Multiple R = .271; Standard Error = 7.999; F = 3.198 (p < .01)

**p < .01

Table 31

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Supervision of Total Sample

Variables	R	R^2	Change in R^2	r	Beta
Member 1	.156	.025	.025*	-.156	-.113*
Corporation 2	.207	.043	.018*	-.140	-.102*
Member 2	.221	.049	.006*	.142	.081*
Corporation 3	.228	.052	.003*	.136	.059*
Tenure	.229	.052	.001	-.039	-.023

Multiple R = .229; Standard Error = 12.153; F = 2.233 (N.S.)

*p < .05

Table 32

Summary of Results of Stepwise Multiple Regression Analysis of Variables to Predict Satisfaction with Co-workers of Total Sample

Variables	R	R^2	Change in R^2	r	Beta
Member 1	.089	.008	.008	-.089	-.086
Corporation 2	.122	.015	.007	.081	.134
Tenure	.152	.023	.008	.078	.109
Corporation 3	.161	.026	.003	-.021	.068
Member 2	.161	.026	.000	.031	.012

Multiple R = .161; Standard Error = 12.451; F = 1.073 (N.S.)

Table 33

Summary of Stepwise Multiple Regression Analysis of Variables to Predict Overall Job Satisfaction of Total Sample

Variables	*R*	R^2	Change in R^2	*r*	Beta
Member 2	.155	.024	.024*	.155	.138*
Corporation 3	.206	.043	.019*	.146	.144*
Tenure	.213	.045	.003*	.003	.052*
Member 1	.215	.046	.001*	-.105	-.036*

Multiple *R* = .215; Standard Error = 35.799; *F* = 2.469 (*p* < .05)

*$p < .05$

(c) Tenure, and (d) Corporation 3. The variables yielded significant regression coefficients at the $p < .05$ level. The multiple R of .215 reached the $p < .05$ level of signifance. The variables which did not enter into the regression analysis were Member 3, Corporation 1, and Corporation 2.

Quality circle membership group significantly predicted job satisfaction 10 times. Member 1 was a significant predictor for three scales, which were the Promotions, Supervision, and Overall satisfaction scales. In all cases, Member 1 was negatively related to job satisfaction. Member 2 occurred as a significant predictor of job satisfaction five times, once for each of the following scales: (a) Satisfaction with Type of Work, (b) Satisfaction with Pay, (c) Satisfaction with Opportunity for Promotions, (d) Satisfaction with Supervision, and (e) Overall Job Satisfaction. Member 3 significantly predicted Work and Pay satisfaction.

CHAPTER IV

Discussion

The results of the present study indicate that membership in a quality circle, when considered as a variable, is not very useful in predicting the following six facets of job satisfaction as measured by the Job Descriptive Index (Smith et al., 1969): (a) Type of Work, (b) Pay, (c) Opportunity for Promotions, (d) Supervision, (e) Co-workers, and (f) Overall Job Satisfaction. In cases where participation in a quality circle is predictive of a facet of job satisfaction, the association is usually negative (5 times) rather than positive (2 times). This finding is inconsistent with many testimonials and observational reports (e.g., Aubrey & Hirsch, 1983; Barra, 1983; Bureau of Business Practice, 1981; Ingle & Ingle, 1983).

An unexpected finding of the current research was that a fairly substantial amount of the variance of job satisfaction can be explained by a control variable. The control variable was the group of employees who were not quality circle members, yet, desired to join a circle. In most instances, a positive relationship was

found between job satisfaction and not being a quality circle member, but desiring to join a circle.

The results discussed above do not apply to all classes of circle nonmembers. The other category of quality circle nonmembers consisted of employees who did not wish to join a quality circle. This category of nonmembers was not useful in explaining the variance of job satisfaction, although the relationship was usually negative. The preceding discussion will become more apparent as each facet of job satisfaction is discussed.

The category of individuals containing circle nonmembers, who desired to participate in quality circles, was the best predictor of satisfaction with the type of work performed. However, the direction of the relationship between satisfaction with work and the class of nonmembers who wished to participate in the circle process differed by sample. This category of nonmembers significantly predicted positive levels of work satisfaction for Corporation 3 and the total sample, and predicted negative work satisfaction for Corporation 1.

For Corporation 3 and the total sample, being a nonmember who did not wish to join a quality circle was negatively related to satisfaction with the type of work performed. Thus, this category of nonmembers may be utilized for the prediction of negative levels of

work satisfaction. Possibly, these individuals do not value or enjoy work at their respective organizations and, consequently, have no desire to become futher involved in other aspects of the work setting.

Membership in a quality circle predicted work satisfaction for only one sample, Corporation 1. At this corporation, participation in a circle was the most accurate predictor of positive levels of satisfaction with work. Since membership in a quality circle did not predict work satisfaction in the remaining three analyses, it is possible that the circle program at Corporation 1 is structured and operated in a manner that enhances this aspect of job satisfaction.

Thus, membership in a quality circle is not a useful, consistent predictor of satisfaction with the type of work performed. In fact, nonmembership status was more directly related to work satisfaction in two manners. First, high levels of work satisfaction were best predicted by membership in the category of employees who were not circle members and desired to join a quality circle. Second, the class of nonmembers who did not wish to participate in the circle process was the most consistent predictor of low levels of work satisfaction.

The influence of the control variable, tenure, on the quality circle membership groups must be reviewed

before examining the pay and promotion results. The tenure variable was associated with the three membership categories in three basic ways. Employees who were not quality circle members but desired to join a circle had the shortest tenure, whereas quality circle members had the longest tenure. An exception to this finding occurred at Corporation 3, where circle members had the shortest tenure. None of these relationships was strong. Bearing the influence of the tenure variable in mind, the pay and promotion results will be examined.

If the tenure variable had a strong influence on the membership categories, then quality circle members would be the most satisfied with pay since they had the longest tenure, except at Corporation 3. Instead, the reverse occurred.

In only one instance, at Corporation 3, was a significant amount of the variance of pay satisfaction accounted for by membership in a quality circle. Consequently, the class of employees who participated in quality circles was not a useful, consistent predictor of satisfaction with pay.

Of the three membership groups, circle nonmembers who desired to join were the most satisfied with their pay rate. The class of nonmembers who desired to join a circle was predictive of pay satisfaction, as

evidenced by the results for Corporation 1, Corporation 2, and the total sample. This group of nonmembers was the most useful predictor of high levels of satisfaction with pay. On the other hand, the results of Corporation 2 and the total sample indicated that the most useful predictor of low levels of pay satisfaction was the class of nonmembers who did not wish to participate in the circle process.

Membership in a quality circle was predictive of satisfaction with opportunity for promotions at Corporation 3 and within the total sample. The negative relationship between the class of quality circle participants and satisfaction with opportunity for promotions at Corporation 3 was unexpected because, as previously discussed, satisfaction with promotions was expected to decrease with increased tenure. More than likely, the associations between tenure and the circle membership groups were not strong enough to substantially influence the groups' responses to the Promotions scale. Thus, for reasons not pertaining to tenure, participation in a quality circle was the most useful predictor of low levels of satisfaction with opportunity for promotions.

Being in the group of nonmembers who desired to participate in a quality circle predicted the satisfaction with opportunity for promotions of Corporation 2,

Corporation 3, and the total sample. Individuals who are not members of a quality circle, but desire to join a circle, may be satisfied with opportunity for promotions because of two reasons. First, at Corporation 2 and within the total sample, employees who were in the class of nonmembers who wished to join a quality circle had the shortest tenure and would have predictably obtained higher Promotions scores than employees with longer tenure. Second, the group of circle nonmembers who wish to join a circle may have higher expectations than either quality circle members or circle nonmembers who do not desire to join. The second explanation seems to be the most logical because employees who belong to the class of nonmembers desiring to join a quality circle are fairly satisfied with Promotions even at Corporation 3, where quality circle members have the shortest tenure. Since the category of nonmembers who did not desire to participate in a quality circle was a significant predictor in only one instance, nonmembers who wished to participate in the circle process were the most consistent predictors of satisfaction with opportunity for promotions.

Being a nonmember who wished to join a quality circle was predictive of high levels of satisfaction with supervision for Corporation 2, Corporation 3, and the total sample. Only the regression coefficient for the total sample was significant. One possible

explanation for the results may be that this category of nonmembers liked their supervisor and, therefore, desired to join the quality circle in which their supervisor was the leader.

Membership in a quality circle predicted satisfaction with supervision for Corporation 1, Corporation 3, and the total sample. The regression coefficient for the class of employees containing quality circle members was significant only within the total sample. In all cases, participation in a quality circle was negatively related to the criterion variable. It is possible to assume that this association occurred because circle members have a unique relationship with their supervisor since he or she is usually the leader of their circle. Moreover, as depicted by the negative relationship between Supervision and being a member of a quality circle, this relationship may not be satisfactory. This finding suggests that some aspect of the supervisor-quality circle member relationship may hinder the acquisition of high levels of satisfaction with supervision.

The category of nonmembers who did not desire to join a circle was predictive of low levels of satisfaction with supervision at Corporation 2. Perhaps, this dissatisfaction with supervision may be the reason this group of nonmembers do not want to join a circle, in

which the supervisor is usually the leader. On the other hand, the class of quality circle nonmembers who do not desire to join may become dissatisfied with supervision because the supervisor's leadership style may change to accommodate his or her new role as a circle leader.

The latter concept is analogous to Zahra's (1984a) previously mentioned notion of a change in the underlying culture of an organization which is caused by the circle process. In a similar manner, supervisory styles may change as a result of the implementation of the circles. For some reason, quality circle members and nonmembers who do not desire to join respond negatively to the change, while quality circle nonmembers who desire to join a circle have a positive response to the change.

In any case, the set of nonmembers who do not desire to become circle members should be considered an isolated predictor of satisfaction with supervision which is not generalizable to most corporations. The best predictor of high levels of satisfaction with supervision was the class of nonmembers who wished to become members of a quality circle. Alternatively, participation in a quality circle appears to be the most viable predictor of low levels of satisfaction with supervision.

The results of the Supervision scale may have been caused by several factors. Quality circle participants may have low levels of satisfaction with supervision because the circle process operates to hinder the development of a satisfactory relationship between circle members and their supervisor. Perhaps, the supervisor does not perform the role of circle leader as the members think he or she should. In other words, the circle members may develop a set of expectations, which are not fulfilled, concerning the circle leader. Dissatisfaction may be the result of the members' unmet expectations.

Regarding satisfaction with co-workers, the results pertaining to quality circle membership group were not consistent. For example, the group of nonmembers who did not desire to participate in a quality circle only predicted the satisfaction with co-workers score for Corporation 1, and membership in a quality circle only significantly predicted satisfaction with co-workers for the total sample. For two samples, being a quality circle nonmember who desired to join a circle predicted high levels of satisfaction with co-workers and low levels for the remaining two samples.

The category of nonmembers, who desired to become circle members, was the most consistent predictor of satisfaction with co-workers. However, this class of

nonmembers had minimal practical value for discerning the direction of the relationship between the group of nonmembers who did not wish to join a circle and the Co-workers scale. Thus, the mixed results failed to determine the most useful, practical membership group predictor of satisfaction with co-workers.

Nonmembers who did not wish to become circle members appeared as a predictor of Overall Job Satisfaction for Corporation 1 and Corporation 2. Although the regression coefficient of Member 3 at Corporation 1 was not significant, a significant and negative association between job satisfaction and the category of nonmembers who did not desire to join a circle was obtained from Corporation 2. As a consequence, the division of nonmembers, who did not desire to join a quality circle, was not a useful predictor of general job satisfaction because it only predicted in isolated cases.

On the other hand, the group of nonmembers who wished to participate in quality circles was the most consistent predictor of Overall Job Satisfaction. The relationship between this class of nonmembers and general job satisfaction was positive as evidenced by the results obtained from Corporation 2, Corporation 3, and the total sample. Of the three quality circle membership groups, the nonmembers who wanted to participate

in the circle process were the most consistent predictors of high levels of Overall Job Satisfaction.

Participation in a quality circle predicted the Overall Job Satisfaction of Corporation 1, Corporation 3, and the total sample, although the direction of the relationship differed by sample. The relationship between job satisfaction and membership in a quality circle was negative in the two samples from which significant regression coefficients were obtained for quality circle membership. Thus, participation in a quality circle may be the best predictor of low levels of general job satisfaction.

Considering all of the JDI's scales, two prevalent principles emerged from the data. First, the group of employees that is most predictive of high levels of job satisfaction contains individuals who do not belong to a quality circle, but desire to become circle members. This principle applies to every JDI scale except Co-workers. The class of nonmembers who desired to join a quality circle remained the most predictive membership group of the Co-workers scale score, although the directions of the relationships differed.

Another tenet which originated from the data was that the relationship between job satisfaction and participation in a quality circle is almost always negative. Furthermore, quality circle participation is not

the most accurate predictor of job satisfaction. This finding contradicts some previously mentioned observational evidence (e.g., Aubrey & Hirsch, 1983; Barra, 1983; Bureau of Business Practice, 1981; Moretz, 1983).

A possible explanation of earlier studies' (e.g., Zahra, 1984-1985, in press) findings of no significant difference between members' and nonmembers' job satisfaction may be that circle participants and nonmembers, who do not wish to become circle members, possess similar satisfaction levels. In other words, the results obtained from circle members and a specific class of nonmembers may be so similar that an important fact has remained unnoticed in previous studies. There are, actually, three distinct classes of employees and each possesses different levels of job satisfaction.

Limitations of the Present Research

Two notations concerning the limitations of the present study should be mentioned. First, the current study focused upon the job satisfaction of quality circle members and two classes of nonmembers. At no point in the research was the content of the three quality circle programs systematically investigated as a factor in job satisfaction. Possibly, the programs' structural differences may have been a contributing factor to some of the inconsistencies found in the results between samples. Research which determines the effects

of the structure and functioning of a quality circle on job satisfaction would be valuable.

Second, the current investigation did not employ a before-and-after research design. Consequently, the causal effects of quality circles cannot be accurately determined. The results of this study are best viewed as evidence of the existence of certain relationships between job satisfaction and three quality circle membership groups at one point in time.

Implications for Future Research and Industry

Even given the limitations discussed above, the present study has contributed to the body of knowledge pertaining to the relationship between job satisfaction and quality circle participation. This study, along with several previous investigations (Sahra, 1984b, 1984-1985, in press), raises serious doubts about the suggested relationship between quality circle membership and job satisfaction. Several lines of inquiry are suggested.

First, future research should employ experimental or quasi-experimental designs where possible. This would reveal the causal effects, if any, of quality circle membership on job satisfaction. If such a study was conducted, then causal linkages between circle participation and job satisfaction could be inferred.

Second, the differences between the three circle membership groups, with regard to job satisfaction,

maybe attributed to factors other than circle participation or nonparticipation. As Zahra (1984b) states, the relationship between job satisfaction and quality circle membership may be moderated by a variety of variables. Some evidence exists that supports this notion. For example, Zahra's (1984b) study revealed that the following variables may moderate the quality circle participation-job satisfaction relationship: (a) motivational potential score as indicated by Hackman and Oldham's (1975) Job Diagnostice Survey (F = 14.40, p < .001 for Firm A) and (b) age of the circle participants (F = 3.53, p < .05 for Firm A). Research which further investigates potential moderator variables will be of both theoretical and practical value.

Third, although the results of the current research do not indicate that a strong relationship between job satisfaction and circle membership exists, circle participation may be related to other attitudes. Previous research revealed that the possession of the following attitudes is associated with participation in a quality circle: (a) organizational commitment as measured by Porter, Steers, Mowday, and Boulian's Organizational Commitment Questionnaire (1974), t = 2.76, p < .01, (b) job involvement as measured by Lodahl and Kejner's scale (1965), t = -2.13, p < .05,

and (c) low role conflict as determined by Rizzo, House, and Lirtzman's scale (1970), $t = 2.12$, $p < .05$ (Zahra, 1984-1985). The association between quality circle participation and the possession of the above attitudes may not be a cause of circle participation. Instead, individuals who volunteer to particiate in a circle may already possess the previously mentioned attitudes. Further investigations of quality circles' effects on other job-related attitudes would be of interest to both researchers and industry, especially if an experimental or quasi-experimental design is employed.

Fourth, the results of the present study revealed that a large majority of the circle nonmembers do not desire to join a circle. For any circle program to operate successfully, it must be accepted by the employees. Certainly the causes of employees' potential disinterest in the program would be of interest to program operators. A potential research question would be, "Why do circle programs fail to interest employees and how can nonmembers' support of the programs be increased?"

Last, a concept emerged from the current study which is worthy of further investigation. Specifically, there are three classes of employees (viz., quality circle members, circle nonmembers who desire to join a

circle, and quality circle nonmembers who do not wish to participate in the circle program) each with different job satisfaction levels. An issue which future researchers could examine is the causes of these differences. Possibly, an underlying concept could explain the differences. For example, Zahra (1984a) speculates that the implementation of a circle program brings about many organizational changes. As a result, quality circles may change the underlying culture of a corporation, thereby causing some dissatisfaction (Zahra, 1984a). This issue should be investigated to determine if negative reactions among certain employee segments, such as members of a quality circle and nonmembers who do not wish to join a circle, occur.

Summary

The results of the present research indicate that the relationship between quality circles and job satisfaction is worthy of further investigation using experimental or quasi-experimental methods. For the time being, quality circles continue to be a managerial tool for enhancing job satisfaction. However, this study revealed that quality circles may not be an effective tool for increasing employees' job satisfaction. An employee's attitude toward quality circles appears to be a more important determinant of job satisfaction than actual quality circle membership or nonmembership.

Possibly, employees who possess high levels of job satisfaction are more likely to have a positive attitude toward, and volunteer for, quality circles. In any event, the answer to the current investigation's research question has been reached: Quality circle participation is not consistently predictive of high levels of either general job satisfaction or satisfaction with work, pay, promotions, supervision, or co-workers.

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APPENDIX A

Job Descriptive Index

Directions: Think of your present work. What is it like most of the time?

Circle YES if it describes your work.
Circle NO if it does NOT describe it.
Circle ? if you cannot decide

- -

Fascinating	YES	NO	?
Routine	YES	NO	?
Satisfying	YES	NO	?
Boring	YES	NO	?
Good	YES	NO	?
Creative	YES	NO	?
Respected	YES	NO	?
Hot	YES	NO	?
Pleasant	YES	NO	?
Useful	YES	NO	?
Tiresome	YES	NO	?
Healthful	YES	NO	?
Challenging	YES	NO	?
On your feet	YES	NO	?
Frustrating	YES	NO	?
Simple	YES	NO	?
Endless	YES	NO	?
Gives sense of accomplishment	YES	NO	?

Directions: Think of the pay you get now. How well does each of the following words describe your present pay?

Circle YES if it describes your pay.

Circle NO if it does NOT describe it.

Circle ? if you cannot decide.

- -

Income adequate for normal expenses	YES	NO	?
Satisfactory profit sharing	YES	NO	?
Barely live on income	YES	NO	?
Bad	YES	NO	?
Income provides luxuries	YES	NO	?
Insecure	YES	NO	?
Less than I deserve	YES	NO	?
Highly paid	YES	NO	?
Underpaid	YES	NO	?

Directions: Think of the opportunities for promotion that you have now. How well does each of the following words describe these?

Circle YES if it describes the opportunities for promotion.

Circle NO if it does NOT describe them.

Circle ? if you cannot decide.

- -

Good opportunity for promotion	YES	NO	?
Opportunity somewhat limited	YES	NO	?
Promotion on ability	YES	NO	?
Dead-end job	YES	NO	?
Good chance for promotion	YES	NO	?
Unfair promotion policy	YES	NO	?
Infrequent promotions	YES	NO	?
Regular promotions	YES	NO	?
Fairly good chance for promotion	YES	NO	?

Directions: Think of the kind of supervision that your get on your job. How well does each of the following words describe this supervision?

Circle YES if it describes the supervision.
Circle NO if it does NOT describe it.
Circle ? if you cannot decide.

- -

Asks my advice	YES	NO	?
Hard to please	YES	NO	?
Impolite	YES	NO	?
Praises good work	YES	NO	?
Tactful	YES	NO	?
Influential	YES	NO	?
Up to-date	YES	NO	?
Doesn't supervise enough	YES	NO	?
Quick-tempered	YES	NO	?
Tells me where I stand	YES	NO	?
Annoying	YES	NO	?
Stubborn	YES	NO	?
Knows job well	YES	NO	?
Bad	YES	NO	?
Intelligent	YES	NO	?
Leaves me on my own	YES	NO	?
Around when needed	YES	NO	?
Lazy	YES	NO	?

Directions: Think of the majority of the people that you work with now or the people you meet in connection with your work. How well does each of the following words describe these people?

Circle YES if it describes the people you work with.

Circle NO if it does NOT describe them.

Circle ? if you cannot decide.

- -

Stimulating	YES	NO	?
Boring	YES	NO	?
Slow	YES	NO	?
Ambitious	YES	NO	?
Stupid	YES	NO	?
Responsible	YES	NO	?
Fast	YES	NO	?
Intelligent	YES	NO	?
Easy to make enemies	YES	NO	?
Talk too much	YES	NO	?
Smart	YES	NO	?
Lazy	YES	NO	?
Unpleasant	YES	NO	?
No privacy	YES	NO	?
Active	YES	NO	?
Narrow interests	YES	NO	?
Loyal	YES	NO	?
Hard to meet	YES	NO	?

APPENDIX B

Part Two of the Survey Instrument

Directions: Please answer the following questions.

1. How long have you worked at (name of corporation)?

_____

2. How long have you worked during your lifetime?

_____

3. Are you a member of a quality circle?

   Check one: Yes _____ No _____

4. If you are not a member, would you like to be a member of a quality circle?

   Check one: Yes _____ No _____

APPENDIX C

Memo to Survey Participants

Jeannene Hughes is a graduate student at Appalachian State University. Currently, she is completing a Master's thesis on employees' attitudes toward work and quality circles. Miss Hughes will survey (name of corporation) employees on (date of survey). Your cooperation will be appreciated.

APPENDIX D

Cover Letter to Potential Subjects

TO: Survey Participants

FROM: Jeannene Hughes

I am a graduate student at Appalachian State University completing a Master's thesis on attitudes toward work and quality circles. As your supervisor has told you, a survey concerning your attitudes toward work and quality circles is enclosed. All of the employees in your work area are completing this survey. Also taking the survey are other (corporation's) employees whose departments have quality circles.

Do not put your name on the survey because I am just interested in the overall results. The final results will be presented to you and management. When I present the results, employees' responses will be combined together. Therefore, no one will know how each individual responded.

You do not have to take the survey if you do not wish. However, I am the only person who will see the completed surveys, which will be destroyed at the conclusion of the study.

Please read the directions and answer each question carefully. It takes approximately 10 minutes to complete the survey. When you have completed the survey, place it in an inter-office envelope and mail it to:

(Name of Human Resource Director)
Human Resources Department
(Post Office Box and City)

The envelopes will be given to me unopened. If possible, have the surveys completed by August 17, 1984. If you have any questions, contact me at (telephone number). Your cooperation will be appreciated.

VITA

Jeannene Hughes was born in Charlotte, North Carolina, on July 29, 1960. She graduated from West Mecklenburg High School in June, 1978.

In the fall of 1978 she entered the University of North Carolina at Charlotte and began working toward a Bachelor of Arts degree. The degree was awarded in 1982 in the field of Psychology. While attending the university, she was a four-time recipient of the Chancellor's Commendation for Outstanding Scholarship.

Miss Hughes entered Appalachian State University and began studying for a Master's degree in 1982. During the time she spent in graduate school, she was a member of Psi Chi and the American Society of Personnel Administrators. In the summer of 1983, Miss Hughes accepted a research assistantship in Industrial/ Organizational Psychology under the direction of Dr. Michael Cook. She received a degree in Industrial/ Organizational Psychology in May, 1985.

Miss Hughes is the daughter of Jean Blakeney Hughes and Dewitt Douglas Hughes. Her address is Route 14, Box 284, Charlotte, North Carolina 28208.