AD-A146613

NPRDC TR 84-53

AUGUST 1984

LIBRARY
RESEARCH REPORTS DIVISION
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93943

QUALITY CIRCLES (QCs) IN NAVY ORGANIZATIONS: AN EVALUATION

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED

NAVY PERSONNEL RESEARCH
AND
DEVELOPMENT CENTER
San Diego, California 92152

NPRDC TR 84-53

August 1984

QUALITY CIRCLES (QCs) IN NAVY ORGANIZATIONS: AN EVALUATION

Leanne Atwater
Stephen Sander

Reviewed by
Robert Penn

Approved by
Robert Blanchard

Released by
J. W. Renard
Captain, U.S. Navy
Commanding Officer

Navy Personnel Research and Development Center
San Diego, California 92152

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: NPRDC TR 84-53	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE *(and Subtitle)*: QUALITY CIRCLES (QCs) IN NAVY ORGANIZATIONS: AN EVALUATION	5. TYPE OF REPORT & PERIOD COVERED: Technical Report FY81-FY83
	6. PERFORMING ORG. REPORT NUMBER: 72-83-5
7. AUTHOR(s): Leanne Atwater, Stephen Sander	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Navy Personnel Research and Development Center, San Diego, California 92152	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: N0010282WR20135
11. CONTROLLING OFFICE NAME AND ADDRESS: Navy Personnel Research and Development Center, San Diego, California 92152	12. REPORT DATE: August 1984
	13. NUMBER OF PAGES: 91
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*	15. SECURITY CLASS. *(of this report)*: UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Quality circles	White collar	Attitude change
QCs	Job satisfaction	Pre- and post-QC attitude questionnaire
Quality control circles	Job attitudes	Blue-collar
Evaluation	Sick leave usage	Employee morale

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Five methods were used to assess the impact of quality circles (QCs) on Navy organizations and participants: (1) QC expectation questionnaires, (2) pre-and post-QC attitude questionnaires, (3) analysis of organizational indicators, (4) interviews, and (5) QC-process documentation. Subjects were 550, primarily blue-collar, male workers: 372 from three organizations with QCs and 178 from two organizations without QCs (controls). QC organization subjects included both QC members (N = 144) and controls (N = 228). Results indicated that there were no changes attributable to QCs, although

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

S/N 0102-LF-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

QCs did solve job-related problems. Also, during interviews, QC members expressed some perceived benefits, such as improved cooperation and improved communication among themselves and management. Problems that interfered with QC operation were resistance from non-QC members and supervisors and workload conflicts.

FOREWORD

This research was conducted under task area N0010282WR20135 and was sponsored by the Chief of Naval Material (CNM) (MATOOK). Its purpose was to assess the impact of quality circles (QC) in Navy organizations. A previous report on QCs--NPRDC SR 81-21--described QCs and assessed the interest and involvement in QCs in Navy organizations.

Appreciation is expressed to the commanding officers of the CNM activities who participated in this study. Appreciation is also expressed to the QC facilitators and others within participating organizations for their assistance in the extensive data collection efforts.

J. W. RENARD
Captain, U.S. Navy
Commanding Officer

J. W. TWEEDDALE
Technical Director

SUMMARY

Problem

Policy makers and managers continue to be concerned about the declining productivity growth rate in America. This concern has led to the development of various processes designed to improve productivity, product quality, and employee attitudes. One such process is called quality control circles (QCs), where groups of volunteer employees from the same work area meet on a regular basis to identify and analyze work-related problems and to recommend solutions to management. This process is currently being used by hundreds of American companies and 16 federal agencies.

Although training and man-hour costs of QCs are significant, evaluations on the impact of QC programs have been limited.

Purpose

The purpose of this study was to evaluate the impact that QCs had on a number of individual and organizational variables in Navy organizations over a 1-year period. Major research questions were:

1. What individuals who volunteer to be QC members expect from QCs.

2. What impact QCs have on objective organizational measures (e.g., sick leave, awards and promotions, accidents, and beneficial suggestions).

3. Whether QCs have a differential impact on the attitudes and morale of individuals who participate in QCs vs. those who do not participate but who belong to organizations with QCs.

4. Whether QCs have differential effects on white-collar workers vs. blue-collar workers.

5. How QCs actually operate; that is, the frequency of meetings, the average QC attendance, the number of presentations made to management, whether problem solutions are implemented, etc.

Approach

Subjects were 550, primarily blue-collar, male workers: 372 from three organizations that agreed to implement six QCs each on a trial basis for 1 year, and 178 from two organizations that agreed not to implement QCs for at least 1 year (controls). QC organization subjects included QC members (N = 144) and controls randomly selected from QC codes (N = 148) and departments that did not have QCs (N = 80). Within the three QC organizations, QCs had been formed in work areas or codes that expressed interest in the program. QC members and leaders were volunteers. Each activity followed the same basic implementation procedure and used the same QC training procedures and materials. Although all five organizations were staffed primarily with civilians, military personnel held a number of upper-level management positions.

Research questions were addressed using a multidimensional approach:

1. A QC expectation questionnaire was given to QC members at the time they volunteered to participate in QCs.

2. A pre- and post-QC attitude questionnaire was administered in October 1981, 8 weeks after completion of QC training, and again in September 1982 to measure attitudes and perceptions. Because of a lack of significant change in pre-post QC attitudes, the attitudes of QC members who had attended a high percentage of QC meetings were compared with those of QC members who had attended a much lower percentage. A similar type of analysis was done for individuals who expressed high and low levels of job involvement.

3. Organizational indicator data collected before and after QC implementation were analyzed.

4. At QC organizations, interviews were conducted with employees who were involved and who were not involved in QCs at all hierarchical levels.

5. QC-process documentation was compiled to develop a history of the QCs.

Results

1. Responses to the QC expectation questionnaire indicated that employees expected many positive outcomes from QCs. The most frequently mentioned reason for having volunteered was "to solve problems and make the job easier." Volunteers expressed greater job satisfaction at the time they volunteered than they did at the time of the pretest, which was administered after QC members completed training but before QC meetings began.

2. Responses to the pre- and post-QC attitude questionnaires gave no evidence to support a change in job attitudes or perceptions (either positive or negative) in the 1-year pre-post time period. There were no significant changes in QC members' attitudes across time, nor were there significant differences in job attitudes between QC members and QC controls. Also, the follow-on analyses indicated that neither level of job involvement nor amount of participation in QCs influenced the relationship between QC membership and job attitudes. The relationship of QC membership to job attitudes differed as a function of type of work (blue- vs. white-collar). For blue-collar workers, having belonged to a QC was related to negative attitudes and perceptions on both the pre- and post-QC tests; the opposite was true for white-collar workers.

3. Analyses of organizational indicators at QC organizations, including sick leave usage, and numbers of promotions, awards, beneficial suggestions, and accidents, indicated that QCs had no significant impact on these indicators for QC members or QC controls.

4. Interviews indicated that many employees perceived positive outcomes of QCs, particularly in the areas of communication and cooperation. A number of problems were also perceived, including resistance from non-QC members and the attrition and poor attendance of QC members. Interview findings with regard to positive or negative changes as a result of QCs were not generally corroborated by the questionnaire findings.

5. QC-process documentation showed that QCs solved problems. Thirteen out of 15 circles saw solutions through to implementation in the 1-year time period that QCs were studied. Employees identified problem areas in training, safety, quality, and efficiency. Solutions resulted in changes such as the purchase of a new Xerox machine, decreased waste, and shortened time for processing personnel actions.

Conclusions and Recommendations

This study used multiple sources of data to assess the impact of QCs and studied QC members and nonmembers before QC implementation and again 1 year later. QC training was positively received by many QC members. The training provided information and skills concerning the mechanics for objectively studying job-related problems.

The QC process provided an opportunity for members to discuss with management the job-related problem that had been the focus of their QC meetings. A presentation could be made to any level of management, depending upon the nature of the problem. The post-QC test data suggest that the level of management to which presentations are given may influence attitudes toward supervisors. Those who made presentations to high-level managers reported improved relations with supervisors on the post-QC test. Somewhat surprisingly, a number of pre-QC test variables were also related to the level at which management presentations were made. These variables included openness of communication with managers, amount of communication with supervisors, and perceived work group effectiveness. This suggests that there are predisposing factors in different QC groups that influence the level of management that attends the presentation.

The QCs also solved problems important enough to be implemented by top management. Many of the problems solved had been problems for a long time, and their resolution came as a welcome relief to many employees.

The fact that job attitudes differed as a function of type of work suggests that blue- and white-collar workers have different reasons for belonging to and participating in QCs.

Although results from pre-post QC attitude assessment suggest that QCs have no significant impact on job attitudes or organizational indicators, the positive results from interviews suggest that, whether or not QCs are implemented, the statistical concepts and communication skills acquired in training are valuable.

This study suggests that the way QCs are implemented and administered is critical. Potential problem areas that result during QCs include unrealistic expectations; nonsupport or resistance from supervisors, managers, or co-workers; and disruption to work. To be maximally effective, QCs must be incorporated into the organization in ways to minimize these types of potential problems. Diagnosis of the usefulness of QCs to solve particular organizational problems would be most valuable. Initial feasibility studies could then be used to assess managerial and organizational readiness, pinpoint startup and implementation requirements, and identify adequate methods for implementation of QCs.

Diagnosis may also reveal that the organization's needs cannot be met with QCs. If this is the case, other strategies should be considered to improve the health of the organization. QCs should not be considered as cures, nor should they be considered as "can't hurts." They require substantial investments of time, money, and behavioral support. The feasibility, applicability, and potential gains should be carefully considered before commitments are made to implement QCs in any organization.

CONTENTS

INTRODUCTION 1

Problem and Background 1
Purpose 2

APPROACH 3

Organizations 3
Sample 3
QC Orientation/Training 3
Research Instruments 4

RESULTS 6

QC Expectation Questionnaire 6
Pre- and Post-QC Attitude Questionnaires 6
Cluster Formation 7
QC Impact on Job Attitudes and Perceptions 7
QCs and Job Involvement 10
Blue-collar vs. White-collar QC Members 10
QC Attendance 11
Management Presentations 11
Organizational Indicator Data 12
Interviews 12
QC-process Documentation 15

CONCLUSIONS AND RECOMMENDATIONS 43

REFERENCES 49

APPENDIX A--QC EXPECTATION QUESTIONNAIRE A-0

APPENDIX B--PRE- AND POST-QC ATTITUDE QUESTIONNAIRE B-0

DISTRIBUTION LIST

LIST OF TABLES

1. QC and Control Members by Type of Activity 4

2. Summary of Items in Pre- and Post-QC Attitude Questionnaires 5

3. QC Expectation Questionnaire Responses 17

4. Final Sample by Organization 18

5. A Description of Scales Created from QC Attitude Questionnaire Items 19

6. Alpha Coefficients and Pearson Correlations for Attitude Scales 22

7. Pre- and Post-QC Means for Subjects in QC and Control Organizations on Attitude Scales that Showed Significant Changes Over Time 33

8. Differences in Pre- and Post-QC Means on 43 Selected Questionnaire Items for QC Members and Controls 34

9. Correlations Betwen QC Membership and Scale Scores for Blue- and White-collar Workers 35

10. Means, F-values, and Probabilities for Scales with Significant Differences by Level of Presentation 36

11. Means and Standard Deviations of Sick Leave Usage Within QC Organizations 36

12. ANOVA Summary Table of Sick Leave Usage Within QC Organizations 37

13. Data on Organizational Indicators at QC Organizations 37

14. Interview Categories Generated from Interviews at QC Organizations 38

15. Percentage of Responses in Selected Interview Categories by QC Organizations and Type of Employee 40

16. Estimated Hours per Week QC Members Spent on QC Activities Outside of QC Meetings 41

17. QC-process Documentation Summary 42

LIST OF FIGURES

1-29. Changes in attitudes reported for QC members from pre- to post-QC test administration 23

30-58. Changes in attitudes reported for QC members and QC controls from pre- to post-QC test administration 28

INTRODUCTION

Problem and Background

Policy makers and managers continue to be concerned about the declining productivity growth rate in America. This concern has led to the development of various processes designed to improve productivity, product quality, and employee attitudes. One such process is called quality control circles (QCs), where groups of volunteer employees from the same work area meet on a regular basis to identify and analyze work-related problems and to recommend solutions to management. This process is currently being used by hundreds of American companies and 16 federal agencies.

QCs began in Japan with the development of quality control programs. This development was guided by two Americans, Dr. W. E. Deming and Dr. J. Juran. In 1950, Dr. Deming conducted for the Japanese a quality control seminar designed to teach the basics of control charts and sampling inspection. This seminar attracted the attention of Japanese engineers, who began the work with statistical methods of quality control. In 1954, Dr. Juran lectured on the application of quality control to Japanese employees at the supervisory levels. Finally, in 1962, quality control principles were extended to production workers, which marked the beginning of quality control circles (QCs).

The QC concept of integrating production workers into the quality control function to improve product quality spread rapidly. In 1981, Gryna reported that there were nearly one million QCs in Japan. These QCs were credited with the savings of billions of dollars, improvement in worker motivation, and the provision of opportunities for workers to interface with management (Juran, 1978).

The tremendous savings attributed to Japanese QCs and the growing stature of Japanese industries were an impetus for United States firms to consider QCs. The private sector first implemented QCs in the early 1970s, followed by the public sector--the Norfolk Naval Shipyard--in 1979. These were the first documented uses of QCs in the United States, but other programs had been used before this time to acknowledge the value of worker participation.

Although a substantial amount of research has been done to assess the effects of participative management and the use of labor management programs, results in these studies are inconclusive. For example, an evaluation of one of Ford Motor Company's employee involvement (EI) programs (Guest, 1982) indicated that the EI concept was functioning well, resulting in positive attitude changes on a number of dimensions. However, although the evaluation appeared to be methodologically sound, the program differed in some ways from the traditional QC approach and the evaluation was conducted by a consulting firm that was also involved in the implementation of the EI.

Cummings and Molloy (1977) reviewed 78 studies that assessed strategies for work improvement, including participative management. They concluded that some of the approaches did indeed effect positive changes, but many of the studies that claimed positive results actually fell short because they had inadequate experimental designs. Locke and Schweiger (1979) and Lowin (1968) also cautioned against the conclusion that improved attitudes and productivity necessarily follow from participation; most participation studies suffer from validity problems, uncontrolled variables, or other methodological flaws.

Evaluations that have been made of QCs suggest mixed results and suffer from methodological flaws similar to those found in the participative management studies. Most available information is in the form of case studies, testimonials, or recommendations for QC implementation strategies (Amsden & Amsden, 1980; Goodfellow, 1981; Klein, 1981; Yager, 1981). Organizations that do publish results of their QC programs often report ratios of dollar costs to savings, along with testimonies of improved morale and job satisfaction (Bryant & Kearns, 1982; Law, 1980). Other available reports contain information by persons who implement QCs and therefore have a vested interest in seeing improvements.

Some objective analyses of QCs have been attempted (Donovan & Van Horn, 1980; Harper, 1982; Horn, 1982; Patchen, 1980; Rich, Ryland, & Ruggerio, 1982; Steel, Lloyd, Ovalle, & Hendrix, 1982). Unfortunately, however, appropriate experimental procedures were not always applied and the results are limited. For example, control groups similar to the QC groups were not always used to assess changes. In other cases, methodological information necessary to interpret the results (necessary background, QC organization, and procedures) was lacking. Still other difficulties include small sample sizes, lack of statistical analyses, conclusions based solely on observations, and studies conducted over restrictively short time frames.

Two areas shown to be worth further investigation in relation to changes in employee attitudes across time were the level of member involvement in QCs and the type of work group within which QCs operated. The results of an investigation by Novelli and Mohrman (1982) into the level of participation by QC members across a given time period indicated that QC membership had different effects upon attitudes, depending upon the amount of program participation. These results were derived from pre- and post-QC attitude surveys administered to two groups of QC members--continuous participants and intermittent participants--and to a control group of non-QC participants. At the posttest, the continuous-QC participants showed a positive change in attitude on some measures, while the other two groups, particularly the intermittent QC participants, showed a negative change.

Blair (1982) points out that most QC programs have dealt with blue-collar work groups. While this is worthwhile, the government also employs a huge white-collar work force. Because blue- and white-collar workers may differ in their orientations toward work (Hulin & Blood, 1968), they may also differ in their response to a program like QCs. To ascertain the generalizability of findings, the impact of QCs for blue- and white-collar workers should be assessed separately.

Purpose

The purpose of this study was to evaluate the impact that QCs had on a number of individual and organizational variables in Navy organizations over a 1-year period. Major research questions were:

1. What individuals who volunteer to be QC members expect from QCs.

2. What impact QCs have on objective organizational measures (e.g., sick leave, awards and promotions, accidents, and beneficial suggestions).

3. Whether QCs have a differential impact on the attitudes and morale of individuals who participate in QCs vs. those who do not participate but who belong to organizations with QCs.

4. Whether QCs have differential effects on white collar-workers vs. blue-collar workers.

5. How QCs actually operate; that is, the frequency of meetings, the average QC attendance, the number of presentations made to management, whether problem solutions are implemented, etc.

APPROACH

Organizations

Six organizations within the Naval Material Command were selected to participate in the study based on the results from a previous study that assessed interest and involvement in QCs among Navy organizations (Atwater, 1981). Criteria for selection were that the organizations (1) employed a sizeable number of blue- and/or nonprofessional white-collar workers, (2) were interested in but had not already implemented QCs, (3) were located in the Continental United States, and (4) agreed to participate in a QC evaluation study. Four of the organizations--three industrial activities and one research activity--were selected to be QC organizations because they were already in the planning stages of implementation. The other two--an industrial activity and a personnel activity--were selected to be control organizations because they had agreed not to begin QC implementation until the study was completed. However, one of the QC organizations--the research activity--was dropped since it could not begin implementation in time for the study.

Sample

At the three remaining QC organizations, management agreed at the outset to establish at least six circles and not to expand that number rapidly for the duration of the study. Within each of these organizations, the circles were formed in work areas or codes that had expressed interest in the program. Within these codes, QC members and leaders (N = 144) were volunteers, as volunteerism is a prerequisite to the traditional QC process. Also, persons not participating in QCs were randomly selected from each QC code to serve as code controls (N = 148) and additional controls were randomly selected from departments that had no QCs (N = 80). The final sample, including 372 persons from the three QC organizations and 178 persons from the two control organizations, is shown in Table 1. Sample members were primarily male, blue-collar workers.

QC Orientation/Training

Before the study commenced, top management at QC organizations selected a QC facilitator from those who volunteered for the position. (This facilitator's position was full-time at two of the three QC organizations.) The facilitator received 1 week of QC training and then began orienting persons at the activity to the QC process, beginning with top management and proceeding down to first-line supervisors. Next, he gave a presentation on the QC program to employees from work groups who had expressed interest in belonging to QCs. Finally, he provided training for QC leaders and members. Member training lasted 8 hours and was conducted 1 hour a week for 8 weeks.

Table 1

QC and Control Members by Type of Activity

	Type of Activity	Circles	QC Members	Control Members			Total Members
				QC Code	QC Dept.	Total	
	QC Organizations						
1.	Industrial	6	44	19	27	46	90
2.	Industrial	6	42	56	20	76	118
3.	Industrial	6	58	73	33	106	164
	Total	18	144	148	80	228	372
	Control Organizations						
1.	Personnel	--	--	--	--	103	103
2.	Industrial	--	--	--	--	75	75
	Total	--	--	--	--	178	178
	Grand Total	18	144	148	80	406	550

Research Instruments

A multidimensional approach was used to assess the various research issues, as discussed below.

1. QC expectation questionnaire (Appendix A). This questionnaire, given to QC members at the first training session, was designed to assess (a) reasons members volunteered to participate in QCs, (b) potential obstacles to QC success, (c) positive outcomes expected from QCs, and (d) job satisfaction.

2. Pre- and post-QC attitude questionnaires (Appendix B). These questionnaires were designed to determine whether participation in QCs had any effect on attitudes in 14 general areas, as summarized in Table 2. The questionnaire was administered in October 1981 to all participants at QC organizations (at the end of member training), as well as to all participants at control organizations. About a year later, it was administered again to all participants.

3. Organizational indicator data. Measures of (a) sick leave used, (b) promotions received, (c) awards received, (d) beneficial suggestions submitted, and (e) accidents that occurred were obtained for all study participants from 1980 through 1982.

Table 2

Summary of Items in Pre- and Post-QC Attitude Questionnaires

Attitudes and Perceptions[a]	Research Source	Section/Item in Appendix B
Impact of job characteristics	Jenkins, Nadler, Lawler, & Cammann (1975)	1/1-10
Organizational effectiveness/ work center effectiveness	Young, Riedel, and Sheposh (1979)	2/11-15
Supervision/supervisors' work-related behavior	Young et al. (1979)	3/16-29
Job involvement and ambition	Lawler and Hall (1970) Lodahl and Kejner (1965)	4/30-34 4/35-38
Motivation/level of interest and effort put forth	Lawler and Hall (1970) Patchen (1965) Young et al. (1979)	5/39-42 5/43-47 5/48-49
Communication with supervisors and co-workers	Georgopoulos (1962) Author (created for this study)	6/50-71 6/72-78
Group process/cooperation and work-group cohesiveness	Franklin (1973) Young et al. (1979)	7/79-85 7/86
Role stress/clarity of role expectations	Rizzo, House, & Lirtzman (1970)	8/87-102
Working conditions/environment	Lau (1979)	9/103-104
Organizational climate/job requirements and rewards	Pritchard and Karasick (1973) Campbell and Beaty (1971)	10/105-111 10/112-117
Social climate/friendliness and support among workers	Moos (1976)	11/118-127
Work group dynamics	Franklin (1980)	12/128-149
Job satisfaction	Young et al. (1979) and Franklin (1980)	13/150-162
Organizational commitment	Mowday, Steers, & Porter (1978) Author (created for study)	14/163-177 14/178

[a]Most measures were adapted from questionnaires developed by other authors who are listed in the source column.

4. Interviews. At QC organizations, interviews were conducted with QC members, leaders, supervisors, managers, controls, and attrites. QC members and controls were generally interviewed in small groups. However, members from at least one circle at each activity were interviewed individually to ensure that individual responses were not suppressed by group interviews. QC attrites, supervisors, and managers were interviewed individually. Interview topics included: (a) overall reaction to QCs, (b) changes as a result of QCs, (c) problems with QCs, (d) QC training, and (e) reasons for having QCs.

5. QC-process documentation. Data concerning the QC process were collected from the time of the first QC meeting to the administration of the post-QC questionnaire. Data included (a) summaries of QC meeting activities and attendance, (b) summaries of management presentations made by QCs, (c) regular meetings and phone contacts with QC facilitators, and (d) information about existing productivity programs and significant organizational changes. These data were intended to provide a historical perspective and an understanding of the QC process over time.

RESULTS

QC Expectation Questionnaire

Of the 144 QC members, 113 responded to the QC expectation questionnaire. Responses are summarized below:

1. Reasons for volunteering. QC members were given a list of 13 reasons for volunteering to participate in QCs and asked to check those they felt were most important. Table 3,[1] which lists these reasons by frequency of selection, shows that the most frequently mentioned reason was "I thought QCs might solve some problems and make my job easier," followed by "I wanted a chance to solve work problems." It is significant to note that pressures from supervisors or desires for recognition and promotion were not critical factors, as indicated by only one response in each of these categories.

2. Potential obstacles to success. QC members were given a list of six potential obstacles to QC success and asked to check those that they most expected. Table 3, which lists the obstacles by frequency of selection, shows that the two most often indicated were "employees losing interest" and "management not implementing circle ideas."

3. Positive outcomes expected. QC members were given a list of 16 positive outcomes and asked to check those they felt would most likely result. These outcomes are listed by frequency of selection in Table 3.

4. Job satisfaction. QC members were asked to indicate how satisfied they were with 13 job aspects. Since these items are identical to those used in the QC questionnaire, results are described below.

Pre- and Post-QC Attitude Questionnaires

A total of 331 subjects were available for both pre- and post-QC questionnaire administration--205 from QC organizations and 126 from control organizations. These

---

[1]Because of the large number of tables and figures in this section relative to the amount of text, they are placed at the end of this section, commencing on page 17.

subjects were further categorized by blue- and white-collar workers (see Table 4), since one research question concerned differences between the two groups. Most analyses included data for only those persons available for both questionnaire administrations. However, in certain comparisons, QC attrites with pre- and post-QC data (N = 43) were also included.

Cluster Formation

To reduce the 178 items in the pre- and post-QC questionnaires to a smaller number of meaningful constructs, a separate cluster analysis was run for each of the 14 questionnaire sections. Based on the results of these analyses, scales were created representing 31 constructs, as shown in Table 5. For example, from the cluster analysis run on the 10 items measuring general job characteristics, two scales were formed. One measured interpersonal or cooperative aspects of the job (work cooperation); and the other, high level skills necessary to do the job and a feeling of accomplishment stemming from the job (job accomplishment).

Item scores for items that comprised a scale were added together to form scale scores and the resultant totals were divided by the number of items used in their creation to create scores that were meaningful with respect to the response scales of original items. Missing data were handled such that when an individual did not answer over 33 percent of the items that comprised a scale, that scale score was coded missing for that individual. The percentage of missing data on items and scales was low, with a range from 0.4 to 3.7 percent.

Scales were formed on the basis of (1) the similarity coefficients generated from the cluster analyses and (2) the content of the items. Occasionally, judgments had to be made about which items made up the most logical, cohesive scale. Because this is not a totally objective process, once clusters were formed, reliabilities of those scales were computed.

Measures of scale reliability or internal consistency were computed on the scores of respondents' who completed both pre- and post-QC questionnaires. Cronbach's alpha coefficient or, in the case of two-item scales, Pearson correlations, are presented in Table 6.

QC Impact on Job Attitudes and Perceptions

Comparison of Attitudes of QC Members Over Time. The primary question in this study concerned the impact of QCs on individuals' attitudes, as measured by their responses to items comprising attitude scales, over time. Figures 1 through 29[2] present changes in attitudes reported for QC members (i.e., those who were in QCs at the pretest and at the posttest) from pre-QC to post-QC implementation. As can be seen on many of the figures, there were no noticeable changes, in either a positive or a negative direction. Because the differences were so slight, statistical significance tests were not performed as it was felt that even statistically significant differences would not represent meaningful differences. Visual examination of the figures suggests a slight reduction in feeling ambiguous about one's job (25), and a slight improvement in perceptions of satisfaction with the results of one's work (3), management communication (15), work group effectiveness (17), input into work decisions (21), and job accomplishment (27).

[2]Scales for "people you work with" and "desired work group characteristics" were not included as they were considered to be descriptive rather than attitudinal.

There were slight negative trends in perceived fairness of pay (23) and friendliness or flexibility of the organization (22). Very tentative conclusions should be drawn from these analyses as differences were few and of small magnitude.

Comparison of Attitudes of QC Members and QC Controls Over Time. Another perspective was gained concerning the impact of QCs by comparing pre- and post-QC attitudes of QC members and QC controls, as shown in Figures 30 through 58. While the apparent differences were again small, analyses of variance (ANOVAs) were performed with the expectation that there might have been significant interactions--that is, QC members would display no attitude changes from pre- to post-QC tests while QC controls would become more negative. This was not the case. Instead, the significant differences were either between time one (pre-QC) and time two (post-QC) across groups or between QC members and QC controls over time.

Four attitude scales showed significant effects ($p < .05$) over time: job ambiguity (48), input into work decisions (38), fairness of pay (41), and work group effectiveness (35). This suggests that, in general, perceptions of ambiguity about the job, the amount of input employees had in decisions, and work group effectiveness improved in the pre- and post-QC time period, while perceptions of the fairness of pay worsened. These findings were consistent with the trends observed when only QC members were assessed. It was speculated that the introduction of QCs into the QC organizations influenced all organization members in ways that caused some or all of these changes.

Pre- and post-QC means obtained on those four attitude scales by subjects in QC and control organizations, presented in Table 7, can be used to help interpret ANOVA results. As shown, in QC organizations, reductions in job ambiguity were large for department controls and small for QC members and code controls (.20 vs. .06 and .02). Thus, it could hardly be speculated that QCs were responsible for this change. As for work group effectiveness, members of QC organizations perceived more improvement than did members of control organizations. At QC organizations, perceived input into work decisions improved for QC members and code controls, while they worsened for department controls. Finally, perceived fairness of pay worsened in all groups in QC organizations and improved in the control organizations. These results indicate that QCs may have contributed to changes in perceptions of input, work group effectiveness, and fairness of pay.

ANOVAs also showed significant differences in attitudes between QC members and QC controls over time for five scales--fairness of pay (41); satisfaction with co-workers, supervisor, and results (53, 54, 56); and overall satisfaction (55). It appears that QC members were less satisfied than were QC controls at both the pre- and post-QC assessments. Although this seems to indicate that individuals who joined QCs were less satisfied than were those who did not, the satisfaction data obtained from the expectation questionnaires embellishes this interpretation. When satisfaction data obtained at the time QC members volunteered were included (see dotted lines in Figures 53-56), it was apparent that QC members were substantially more satisfied at the time they volunteered than they were at the time of the pretest. They were also generally more satisfied on this early measure than were their control counterparts at the pretest. It may be that, when persons volunteered for QCs, they had unrealistically high expectations, which temporarily inflated their reports of satisfaction. It is also possible that the QC process served to accentuate some feelings of dissatisfaction. The relative consistencies over time from pre to posttest for both QC and control groups tended to support the contentions that expectations at the time members volunteered temporarily inflated respondents' reports of their satisfaction. The consistent QC/control differences suggested that those who joined QCs were generally the less satisfied employees who hoped to make changes.

It also appears, as can be seen in Figure 41, that perceptions of fairness of pay worsened over the 1-year time period. Since this effect occurred only in the QC organizations, it appears that it probably was not due to nationwide economic factors. Novelli and Mohrman (1982) found that QC members expressed concern that the company benefited from their efforts and that they had not received additional compensation. Perhaps employees in QC organizations felt more deserving of higher wages in return for their efforts in QCs. These are only speculations as no empirical data were obtained to substantiate such explanations.

Examination of Individual Questionnaire Items. Because the results did not support the expectation that QCs would have a positive impact on a number of job attitudes and perceptions, additional analyses were performed, using individual questionnaire items rather than composite scale scores. It was believed that the composites may have disguised some effects that would become apparent when the individual items were examined (i.e., changes in items in different directions--some positive and some negative--may have cancelled each other and resulted in no changes in scale composites when scale means were obtained).

A total of 43 items were examined. Conducting significance tests was not felt to be appropriate because the scales had shown no differences and conducting 43 independent tests would have inflated the chances of statistical significance on some tests. Observation of the data, shown in Table 8, indicated that, again, there were surprisingly few changes from pre- to post-QC implementation for either QC members or QC controls. Also surprising was the number and content of items that changed in a negative direction for the QC members. For example, a number of items that dealt with work group relations showed changes in a negative direction for QC members. Also, the amount of communication QC members reported they had with supervisors on various topics also decreased. Since the respondents in these analyses had the same supervisor throughout the 1-year study, a change in supervisors could not have accounted for the decreases.

Because statistical significance tests were not appropriate, generalizations from these data should be made with caution; however, some findings are worthy of mention. First, on over half of the items, both QC members and QC controls had more negative attitudes or perceptions at the posttest than they did at the pretest. Perceptions that became more negative for QC members were measured by items that dealt with personal satisfaction and caring about the job, communication with supervisors and managers, and work group atmosphere. These factors were expected to be impacted positively by QC membership, but apparently they were not. On the other hand, there were some positive changes with respect to communication between QC members and department heads and outside departments, problem solutions, and input into work decisions. It seemed that QCs had some positive impact on job-related matters (input and problem solving) but they negatively impacted on perceptions of work group relations and communications with supervisors. Again, these conclusions are tentative, but the overall patterns suggested some interesting changes. If, in fact, these types of positive and negative changes were not due to chance, the opposing influences QCs seem to have on different aspects of one's working life could have impacted attitudes and perceptions in opposing ways. In other words, some influences were positive (e.g., they had more input into decisions) but some were negative (work group relations seemed worse), with the net result that there were no significant changes in areas of satisfaction, commitment, job involvement, or other indicators of improved work attitudes. It is also possible that these changes were chance variations that would not be expected to occur if the study were repeated. Therefore, they would not be expected to affect job attitudes.

QCs and Job Involvement

Level of involvement in the job was considered a potential moderator of the impact of QCs. Strauss (1974) suggested that workers could be divided on the basis of their job orientation into expressive types (those who value work as an end in itself) and instrumental types (those who look upon the job merely as a means toward another end).

Rabinowitz and Hall (1977), in their review of the organizational research on job involvement, concluded that situational variables in the work place seemed to have more effect on the attitudes of low-job-involved persons (instrumental types) than on high-job-involved persons (expressive types). Since QCs can certainly be seen as a situational change, these effects could be influenced by levels of employee job involvement. It was speculated that differing levels of job involvement among QC members contributed to the apparent lack of changes in attitudes and perceptions as a result of QCs.

A mean composite measure of job involvement was created from pre-QC test scores obtained on the three items making up the job involvement scale (D1, D2 and D4--see Table 5) and used to classify respondents into high- and low-involvement groups. Respondents whose mean score was less than 2 (indicating agreement that the job was important and there was involvement) were categorized as high on job involvement; and those whose mean score was more than 2, as low on job involvement. It was already known that QC members and QC controls did not have significantly different levels of job involvement (see Figure 47). Mixed-design ANOVAs were run (QC members vs. controls by high- vs. low-job involvement by pre-QC test vs. post-QC test) on the 29 attitude scales derived from the questionnaire items. The anticipated results--3-way interactions--were not found. Instead, a number of variables had main effects for level of involvement; that is, those high on job involvement had different attitudes and perceptions regardless of the time of measurement and whether they were in QCs or not. This finding was interesting and supported previous research on job involvement, but it did not provide any additional information as to why QCs had little or no effect on attitudes. It was concluded from these results that neither volunteering to be in a QC nor changes that resulted from belonging to a QC were related to levels of job involvement.

Blue-collar vs. White-collar QC Members

On the QC expectation questionnaire, respondents were asked to indicate the reasons they volunteered to participate in QCs (see Table 3). There were no differences in the proportion of blue- and white-collar workers who listed any of the 13 reasons for volunteering. However, when the relationship between attitudes and job perceptions and QC membership was investigated, an interesting phenomenon emerged. As shown in Table 9, the correlations between QC membership and job attitudes on both pre- and post-QC test measures were almost exclusively negative for blue-collar workers and almost exclusively positive for white-collar workers. The chi square performed on the number of positive vs. negative correlations for blue- and white-collar workers was highly significant ($\chi^2 = 66.06$, df = 1, $p < .001$). This result strongly suggests that belonging to a QC is related to negative attitudes and perceptions for blue-collar workers and to positive attitudes and perceptions for white-collar workers. Since this relationship held on both the pre- and post-QC test scales, it did not seem to be a phenomenon that resulted from membership in QCs but, rather, one related to having joined, which did not change as a function of having belonged.

QC Attendance

Previous research has demonstrated that the amount of actual participation in job improvement programs can affect the impact they have upon participants (Novelli & Mohrman, 1982). Since attendance at the QC meetings was felt to be the most basic measure of involvement or participation in the program, analyses were run to compare QC members who had attended over half of the meetings with those who had attended less than half.

Comparisons were made on the post-QC measures of the 29 scales. Only one showed a significant difference. Since one or two scales out of 29 were expected to differ significantly by chance, the comparison was not considered meaningful. Essentially, the amount of participation, as measured by attendance, had no impact on attitudes or perceptions 1 year after QC implementation.

Management Presentations

The actual QC process involved three basic steps: problem identification, problem-solving, and presentation of the problem and solution to management. Since management presentations are seen as an important aspect of QC programs, whether or not circles make presentations and the level of management that observes them were hypothesized to have an effect on how QCs impacted members. One-way ANOVAs by type of presentation were performed on pre-QC and post-QC responses to 29 of the attitude scales. Respondents included in the analyses were all employees who had been involved in QCs, including those presently involved (N = 62) and attrites with pre- and post-QC test data (N = 43) (see Table 4). Forty-five persons made no presentation, 19 made low-level presentations (to managers below the department head level), and 36 made high-level presentations (to the activity's commanding or executive officer and/or department heads). (Data were missing for 5 people.) Table 10 presents means, F-values, and probabilities for the scales that differed significantly--six on pre-QC measures and four on post-QC measures. These results suggest a number of interesting interpretations.

First, the fact that six differences occurred before QC implementation suggests that some pre-existing factors may be relevant to the type of presentation made. For example, those making high-level presentations had the most positive perceptions of the level of management communication at the time of the pre-QC test. It could have been that these persons had better relationships with managers and greater likelihood of getting top management to hear their presentation. Both groups that made presentations had more positive perceptions of supervisory communication and cared more about their jobs at the time of the pre-QC test than did those who never made presentations.

Two of the four scales that differed on post-QC measures concerned supervision. Members of groups that made presentations had more positive perceptions of their supervisors than did those who made no presentations. Two scales--fairness of pay and work group effectiveness--differed significantly on both the pre- and post-QC measures. Surprisingly, the no-presentation group reported the highest work group effectiveness at both times. The low-level presentation group had the most positive perceptions of the fairness of pay. These effects were difficult to explain. They may have been caused by particular features of the presentation level group, but none were apparent.

These data suggest that attitudes toward supervisors before QC implementation may have been related to the level of management to whom the presentations were made, and that this level may also have impacted on attitudes toward supervisors. Although these

findings were not dramatic, the two-way relationship between attitudes and the level of management presentations is considered worthy of mention.

Organizational Indicator Data

Organizational data indicating the well-being of activities were collected for three calendar years (1980, 1981, 1982) for all subjects at the five participating organizations. Indicators included numbers of sick leave hours used, promotions received, awards received (and other forms of formal recognition such as outstanding performance evaluations), accidents that occurred, and beneficial suggestions made.

Sick leave usage was considered to be an indicator of morale. Although much sick leave is used for legitimate illnesses, it was felt that reductions in sick leave usage would indicate improved attitudes, such as improved interest in or commitment toward work. This study found that job attitudes such as level of involvement, how much time drags at work, perception of management support, and levels of job satisfaction and commitment were significantly correlated with the amount of sick leave taken, which supported the hypothesis that sick leave was an indicator of morale. The sick leave indicator used was determined by dividing the number of sick leave hours used per year by the number accrued per year, to account for individuals who had not worked an entire year and who had accrued less than the usual 104 hours. Also, persons who had used over 200 hours of sick leave were dropped from analyses as it was felt that using this amount of leave was indicative of some long-term or chronic illness. Less than 3 percent of the people were in this usage bracket in any year.

The data of primary interest for this study were obtained for years 1980 and 1982. Since QCs were introduced to the QC organizations in the fall of 1981, 1980 was clearly pre-QC and 1982 was clearly post-QC.

A mixed-design ANOVA--a repeated measure for sick leave usage in 1980 and 1982 and a between-group measure for QC and non-QC within the three QC organizations--was used to analyze sick leave usage within QC organizations. Results are shown in Tables 11 and 12. While the anticipated effect was an interaction between time and QC membership, the cell means and the main effect for QC membership ($p < .10$) indicates that QC members used less sick leave both before and after QC implementation than did QC controls. This indicates that QCs had no impact on sick leave usage, but that those who joined QCs and continued to belong tended to take less sick leave than did others.

Table 13, which provides data on promotions, awards, accidents, and beneficial suggestions at QC organizations, shows that the percentage of persons involved was very small and did not differ in the pre- and post-QC periods. The only noticeable difference was the absence of beneficial suggestions submitted by QC members in 1982. This indicated that QCs served as an alternative means for presenting and accepting ideas.

Interviews

Interviews were conducted with employees, both those who were involved and not involved in QCs, at all levels of the three QC organizations. The interviews were semistructured in that individuals were asked specific open-ended questions. All responses were transcribed and classified under 12 categories, as shown in Table 14. Frequency and percentage of response were computed by organization and by type of employee (blue-collar, white-collar, and manager) for each category and subcategory. Because questions were open-ended and many interviews were conducted by group, the

number of persons expressing particular views was not available. Instead, all comments were categorized by content, and the numbers of responses in each category was tallied.

The vast majority of effects or changes that resulted from QC implementation fell into three categories: individual attitudes/orientation, communication/cooperation, and organizational effectiveness. As shown in Table 15, which provides response percentages for the five most important interview categories, the largest percentage of responses concerning changes in the individual attitudes/orientation category fell into the subcategory representing greater interest in and more positive feelings about work (N = 40). Only one subcategory--lower morale--represented attitude changes in the negative direction. This subcategory accounted for 9 percent of the category responses and was mentioned exclusively by blue-collar workers.

Under the communication/cooperation category, the subcategories entitled improved communication and improved cooperation accounted for over 60 percent of the responses. These subcategories were mentioned across organizations and across types of positions. Of the 243 comments in this category, all except 4 were positive. The comments included the following:

1. More open-minded.
2. More harmonious/more cooperative and less antagonism among different sections.
3. People are more cooperative in getting and giving information.
4. Increase in communication here.
5. Teamwork--people are not arguing.
6. More people working together as a team.
7. Can better understand others' points of view.
8. More open with one another.
9. More open-minded; more patient.
10. Communication has improved a little, but always was good.
11. QC seems to pull people together.
12. Better information pattern.

The organizational effectiveness category accounted for 165 comments. Of these, 31 (19%) reflected the perception that no changes in effectiveness had occurred due to QCs; and 5, that QCs had a negative impact (all made by blue-collar workers). Thus, there were over three times as many positive comments about QC impact on organizational effectiveness than negative comments.

The management/supervision category concerns both the reactions of and effects upon managers and supervisors. As shown in Table 15, the management responsive/supportive/interested subcategory accounted for 34 percent of the total of 224 responses. The next most frequent response subcategories concern unsupportive management and resistant supervisors, which accounted for 15 and 13 percent respectively of the responses. It is worthy to note that the bulk of the unsupportive management and supervision comments came from only one organization--No. 2.

The final category shown in Table 15 concerns problems that resulted from QCs and that interfered with QC operations. Of the large number and variety of problems, those most often mentioned were resistance or nonacceptance from non-QC members (12% of total) and the attrition and poor attendance of QC members (11%). At organizations 2 and 3, cancellation or interruption of meetings was a sizeable problem.

In contrast to the positive attitudes and improvements in communication expressed by most QC members, some individuals expressed somewhat opposite feelings, as shown in problem subcategories 1, 3, and 12. Most of these negative comments were recorded from interviews with QC controls, managers, or attrites. Their comments revealed a lack of knowledge about QC activities, such as "Not knowing what the QC was doing" and a "Wait and see" attitude. These negative attitudes may have created doubt and silent nonsupport for the QC process and could have impacted on others; both managers and controls commented that it seemed as if the QCs were taking a long time to solve a problem.

Another problem area concerned the impact of QCs on the work staff. Twenty-five comments indicated that work was disrupted due to QCs; and 23, that the workload prevented people from participation in QCs. Both of these subcategories were mentioned as problems at all three organizations. In this regard, Table 16 presents the average hours per week that 17 QC members estimated they spent on QC activities outside of QC meetings. As shown, the time spent ranged from less than 1 hour to 12 hours, with all but two individuals spending less than 3 hours.

The main points generated from the other interview categories are given below:

1. Attrites' experience. QC attrites (see Table 4) were interviewed apart from the QC members who completed the entire study. They indicated that interpersonal conflicts with QC leaders or members and an inability to attend due to workload were the primary reasons they had quit. Other reasons included "Being in a QC was boring," "It didn't seem productive," or "It didn't meet expectations."

2. Training. Over 70 percent of the comments on training, including those from the QC attrites, were positive. Individuals felt that the training was good and that they learned useful skills. Two of the most often mentioned skills were improved methods of communication with others and the ability to be a better listener.

3. Reasons for QCs. When interviewees were asked what they thought the reasons were for conducting QCs, the most frequently given responses were to get workers involved and to become more effective or productive. Improved quality, which was one of the original purposes of QCs, accounted for only 8 of the 237 comments.

4. Long-term effects. The anticipated long-term effects of QCs were generally positive. Employees for the most part felt the problems with QCs could be worked out and that overall benefits would emerge.

5. Comparison of QC and other programs. In response to how QCs compared with other programs that had been used at that activity, the respondents most often used the beneficial suggestion program as a comparison; only 4 comments out of 69 indicated that this program was preferable to QCs.

6. Time. See comment on time above and Table 16.

7. Skills/abilities. Covered under training.

The interviews provided a rich qualitative dimension to this study. They showed that, while many perceived positive outcomes resulted from QCs, a sizeable number of problems and negative side effects also resulted. The integration of the interview data and questionnaire data provided an in-depth look at the kind of impact QCs really had. Apparently, when individuals are asked face-to-face about the effects of QCs, they

report many positive changes; however, when changes in these areas (e.g., communication attitude changes) were measured before QCs were implemented and again 1 year after implementation, the data did not corroborate the testimonies.

An example of the discrepancies between interview and questionnaire results was the positive work group relations scale, which measured communication and the extent of positive relations within work groups. Although pre- and post-QC questionnaire results (see Figure 18) showed no change from time one to time two for QC members, the interviews indicated that increased communication and cooperation had resulted from QCs. Another example in which questionnaire and interview results seemed to conflict had to do with employees' levels of job involvement. Although test results for the uninvolvement in job and job involvement scales (see Figures 8 and 24) showed no change for QC members, 40 comments (37% of the responses) reported increased interest in work and improved attitudes about work as a result of QCs. All but 6 of these 40 comments came from QC members. Speculations about these discrepancies are included under Conclusions and Recommendations.

QC-process Documentation

Table 17 provides data relevant to the nature of QCs. It includes three types of information: (1) purely descriptive (e.g., QC member characteristics and number of QC meetings), (2) developmental (e.g., information dealing with QC membership and projects), and (3) structural (information that is relevant to the members, supervisors, and co-workers).

As shown, only 11 of the original 18 QCs completed the study. The QCs in organization 1 showed the greatest transition in membership as they began with six circles and ended with two (A and B). QC A was the only surviving QC in a department that initially had four QCs, including most of the workers in the department. The major reason for the demise of three of the circles was the heavy workload of the department and a sense expressed by many initial members that their productivity was diminished by attending QCs. The members themselves decided that being at their work station was more important than being at a QC meeting.

The QCs at QC organization 2 also showed a fair amount of transition, with members from two discontinued circles (B and C) being cycled through the remaining circles. QC B terminated due to the lack of management support and QC C members decided to suspend activities until new machinery arrived. QC D lost four members and added six. The QCs at QC organization 3 were more stable over time than were the QCs at the other two activities. While no QCs were terminated, QCs A, C, and F did show some transition. The data analyzed in this study included only those individuals who were QC members at the time of both the pre- and post-QC questionnaire administration.

The number of circle meetings held ranged from 10 to 43. Circle members met less than weekly for different reasons. Some chose to meet every other week, some chose not to meet when there was a heavy workload, and some could not meet every week because meetings had been cancelled by managers or supervisors. At all activities, some members reported that they did not attend particular meetings because of their workload.

In all QCs but one (F at organization 2), the program culminated in a solution to a work-related problem and most of the solutions were accepted and implemented. It was noted that one QC at each activity worked on a project that middle management had been trying to resolve for some time. The fact that the QCs' solutions were accepted by top

management and subsequently implemented in a fraction of the time it normally would have taken was surprising to supervisors. At one activity, for example, a department head had been trying for 5 years to effect a change in an area that was implemented by the QC process. There were also incidents at each activity where supervisors worked on problems the QCs had prepared to work on, which usurped the power of QCs.

Cost savings from projects were estimated by only four QCs. Cost data for the QC program at each activity were received but a number of difficulties arose that made interpretation of these data problematic:

1. The organizations did not agree as to what variables should be considered in estimating costs and benefits of QCs.

2. It was not always possible to estimate dollar savings from QC solutions, especially when the problems solved had to do with improving safety or working conditions. It was also difficult to decide how far in the future savings should be projected.

3. Estimating the cost of man-hours for QC activities was difficult because the 2 hours per week scheduled for meetings was not the only time spent for QCs.

4. Some work areas closed down when QC meetings were being held. The cost of these shutdowns was not estimated.

5. The benefits to the organization from the training members received are difficult, if not impossible, to estimate in terms of dollar savings.

Due to these factors, cost-benefit figures were not calculated. Because there are so many variables to consider, interpretations of cost-benefits in other reports concerning the effects of QCs should be carefully evaluated. It is likely that estimates across organizations, or even across departments within organizations, will not be comparable.

The structure of the QCs among the activities was not standardized and, in some cases, contrasted with the procedures suggested as guidelines to establish QCs. The QC literature has indicated that the QC leader should also be the supervisor. Organization 1 exhibited the greatest deviation in this regard, as two circles had three supervisors for members and none had a supervisor for a QC leader. In four of the six circles, the QC leader was a worker. Organization 3 was relatively more orthodox in its approach: Only two of the six QCs had more than one supervisor and all had a supervisor for a QC leader.

A final point of significance was the interaction between QC members and non-members in the same work area. The ratio of QC members to nonmembers in a QC was quite varied among the QCs. When QC members were not involved in QC activities, they often worked among individuals who were not QC-trained and who were, in some cases, very much in the dark about QC activities. This was especially true for the blue-collar workers at organization 3, who often worked on projects that required them to be in different places at different times.

Table 3

QC Expectation Questionnaire Responses

	Item	Frequency (N = 113)[a]
	Reasons for Volunteering	
1.	I thought QCs might solve some problems and make my job easier.	71
2.	I wanted a chance to solve work problems.	66
3.	I wanted to get the training in problem-solving techniques.	57
4.	I wanted to have a chance to express my ideas.	56
5.	I wanted to find out what QCs were all about.	54
6.	I had heard things about QCs.	18
7.	I wanted to have an hour off my regular work.	11
8.	I wanted my supervisor to recognize my initiative.	7
9.	I thought it would look good on my record.	6
10.	I thought volunteering might lead to promotion or a pay raise.	1
11.	I felt my supervisor wanted me to volunteer.	1
12.	Everyone else in my work group was volunteering.	1
13.	I wanted a chance to be recognized by management.	1
	Total	350[b]
	Expected Obstacles	
1.	Employees losing interest.	63
2.	Management not implementing circle ideas.	50
3.	No signs of improvement to convince management to keep circles.	32
4.	Loss of management's support.	32
5.	Leaders losing interest.	13
6.	Supervisors not letting members go to circle meetings.	11
	Total	201[b]
	Expected Positive Outcomes	
1.	Problems solved.	65
2.	Better quality work.	64
3.	Better communication within my department.	62
4.	More positive attitudes about work.	57
5.	More communication within the organization.	56
6.	Improved morale among employees.	53
7.	Greater productivity.	51
8.	Better relationships with other workers.	51
9.	Employees will be trained to solve problems.	50
10.	Employees listened to by management.	47
11.	More highly motivated employees.	47
12.	Better relations with supervisors.	31
13.	My job will be easier.	31
14.	Supervisors' leadership skills will improve.	22
15.	Reduced absenteeism.	19
16.	Better relationship with union.	11
	Total	717[b]

[a]Number of individuals who completed the questionnaire.

[b]Number of statements checked.

Table 4

Final Sample by Organization

Subjects	QC Organizations			Control Organizations			Total
	Blue-collar	White-collar	Total	Blue-collar	White-collar	Total	
Nonattrites:							
QC Members	41	21	62	--	--	--	62
Controls	105	38	143	62	64	126	269
Total	146	59	205	62	64	126	331
Attrites:							
With pre-post-QC data[a]	--	--	43	--	--	--	43
Without pre-post-QC data[b]	--	--	124	--	--	52	176
Total	--	--	167	--	--	52	219
Overall Total	--	--	372	--	--	178	550

[a]These persons had been in QC training at the time of the pretest but had either dropped out of the circle or had been part of a circle that had dissolved in the 1-year time period. However, post-QC data were obtained for them.

[b]For the most part, these persons had either left the organization or were otherwise unavailable for the post-QC examination (e.g., because of extended sick leave).

Table 5

A Description of Scales Created from QC Attitude Questionnaire Items

Attitude Scale (Abbreviation)	Item Code	Item Description	Similarity Coefficient[a]
1. Job involvement	D1	The most important things that happen to me involve my work.	44
	D2	The major satisfaction in my life comes from my job.	
	D4	I'm very much involved personally in my work.	
2. Uninvolvement in job	D8	I used to care more about my work but now other things are more important.	62
	D9	I used to be more ambitious about my work than I am now.	
3. Doing a good job	E1	When I do my work well, it gives me a feeling of accomplishment.	69
	E2	When I perform my job well, it contributes to my personal growth.	
	E3	I feel a great sense of satisfaction when I do my job well.	
	E4	Doing my job well increases my feelings of self-esteem.	
4. Personally care about organization	E9	To what extent are you satisfied with this job?	43
	EA	To what extent do you feel a high degree of personal responsibility for the work you do?	
	EB	To what extent do you personally care how well the job gets done?	
5. Organizational commitment	N2	I talk up this organization with my friends as a great organization to work for.	55
	N6	I am proud to tell others that I am part of this organization.	
	NA	I am extremely glad that I chose this organization to work for.	
	NE2	This is the best of all possible organizations to work for.	
	N5	I find that my values and the organization's values are very similar.	
	N8	This organization inspires the very best in me in the way of job performance.	
	NB	There is not much to be gained by sticking with this organization indefinitely.	
	ND	I really care about the fate of this organization.	
	NF	Deciding to work for this organization was a definite mistake on my part.	
6. Supervisor support	C1	Supervisor encourages you to participate in important decisions.	61
	C2	Supervisor supports you.	
	C3	Supervisor sees to it you know what has to be done.	
	C4	Supervisor helps you solve work-related problems.	
	C6	Supervisor does a good job judging your performance.	
	C9	Supervisor helps you develop your skills.	
	CA	Supervisor praises good work.	
	CE	Supervisor sees to it good performers are rewarded.	
7. Supervisor's knowledge of job	C7	How well does supervisor know the technical parts of his job?	75
	C8	How well does supervisor know administrative parts of his job?	
8. Supervisor communication	F3	How often do you communicate with your supervisor about problems at work?	46
	F4	How often do you communicate with your supervisor about ways work could be improved?	
	F5	How often do you communicate with your supervisor about ways supervision could be improved?	
	F6	How often do you communicate with your supervisor about work in general?	
	F7	How often do you communicate with your supervisor about employee wages, hours, or benefits?	
	F8	How often do you communicate with your supervisor about your performance?	
	F9	How often do you communicate with your supervisor about ways morale could be improved?	
	FA	How often do you communicate with your supervisor about things outside of work?	
9. Positive relation with supervisor	FB	How often does your immediate supervisor show appreciation for your work?	55
	FC	How often does your immediate supervisor show confidence in you?	
	FE	How often does your immediate supervisor explain things or give information?	
10. Negative relation with supervisor	FG	How often does your immediate supervisor criticize you?	57
	FH	How often does your immediate supervisor give unnecessary information or comments?	
11. Management communication	FO	How well does top management communicate with employees?	41
	FP	How well informed would you say top management is about what really goes on in your work center?	
	FQ	How well does top management respond to ideas from below?	
	FR	There have been avenues available in the last year for communication with department heads.	
	FS	Positive changes have been made in this organization as a result of ideas presented to managers.	
	FT	There have been negative effects on this organization from management failing to listen to those below them.	

[a]The extent to which the pattern of data in the clusters corresponds to the pattern of the original data.

Table 5 (Continued)

Scale Abbreviation	Item Code	Item Description	Similarity Coefficient[a]
12. Management support	J6	Management is interested in the welfare of employees.	71
	J7	Top management is willing to support you and your co-workers.	
13. Work cooperation	A1	Job requires a lot of cooperative work with other people.	52
	A2	A lot of other people are affected by how well your job gets done.	
14. People you work with	FK	How many people outside your work group do you talk with in a week in the process of doing your job?	76
	FL	How many people must you interact with weekly outside your work group in order to do your job?	
15. Work group cohesiveness	G1	Work group plans together and coordinates its efforts.	51
	G2	Work group makes good decisions and solves problems well.	
	G3	Information about important events is shared within your work group.	
	G4	Persons in your work group know what their jobs are and how to do them well.	
	G5	You have confidence and trust in the persons in your work group.	
	G6	Your work group is able to respond to unusual work demands.	
	G7	Your work group really wants to meet its objectives.	
	G8	There is a feeling of group pride among members of your work group.	
16. Positive relations in work group	K2	There is an open, honest communication in your work group.	53
	K3	You feel personally concerned about the welfare of members of your work group.	
	K4	Members of your work group would be concerned and willing to help if you had a problem.	
	K5	You feel sociable toward people from your work group.	
17. Desired work group characteristics	L2	How easy to approach would you like persons in your work group to be?	58
	L4	How much would you like persons in your work group to pay attention to what you say?	
	L6	How much would you like persons in your work group to be willing to listen to your work problems?	
	L8	How much would you like persons in your group to encourage each other to work as a team?	
	LA	How much would you like persons in your work group to emphasize a team goal?	
	LE2	How much would you like persons in your work group to encourage each other to their best effort?	
	LC	How much would you like persons in your work group to exchange opinions and ideas?	
	LG	How much would you like persons in your work group to maintain high standards of performance?	
	LI	How much would you like persons in your work group to help you find ways to do a better job?	
	LK	How much would you like persons in your work group to provide information so you can plan work ahead of time?	
18. Present work group characteristics	L3	Do people pay attention to what you are saying?	58
	L5	Are people in your work group willing to listen to your problems?	
	L7	Do people in your work group encourage each other to work as a team?	
	L9	Do persons in your work group emphasize a team goal?	
	LD	Do persons in your work group encourage each other to give their best effort?	
	LH	Do persons in your work group help you find ways to do a better job?	
	LL	Do persons in your work group offer each other new ideas for solving job-related problems?	
	LJ	Do persons in your work group provide information so you plan work ahead of time?	
	LI	Are persons in your work group friendly and easy to approach?	
	LF	Do persons in your work group maintain high standards of performance?	
19. Job accomplishment	A3	Job gives you a chance to use your personal initiative.	43
	A4	Job is significant and important in the broader scheme of things.	
	A7	Job requires you to handle surprising or unpredictable situations.	
	A8	Performing your job gives a feeling of accomplishment.	
	AA	Job requires you to use a number of high-level skills.	
20. Work group effectiveness	B1	Rating of work center's productivity.	47
	B2	Rating of work center's responsiveness.	
	B3	Rating of work center's adaptability.	
	B5	Rating of work center's quality of work.	
21. Time drags in job	E5	How often does time seem to drag on your job?	44
	E6	How absorbed are you in your job?	

[a]The extent to which the pattern of data in the clusters corresponds to the pattern of the original data.

Table 5 (Continued)

Scale Abbreviation	Item Code	Item Description	Similarity Coefficient[a]
22. Job ambiguity	H1	You know what your responsibilities are.	35
	H2	You feel certain how you will be evaluated.	
	H3	You know exactly what is expected of you.	
	H4	You know you have divided your time properly.	
	H5	Explanations are clear about what has to be done.	
	H6	You are given enough time to do what is expected of you.	
	H7	Seems like you have too much work for one person to do.	
	HE	You feel certain about how much authority you have.	
23. Role conflict	H9	You do things likely to be accepted by one person and not by others.	32
	HB	It is difficult to satisfy everyone at once.	
	HC	You have to break rules to get everything done.	
	HD	People ask you to do things on your job that get in the way of your work.	
	HF	You work under conflicting policies and guidelines.[b]	
	HG	Your work group receives job assignments without enough manpower to complete them.	
24. Fairness of pay	JB	Is your pay fair compared to others in this organization?	40
	JC	Is your pay fair compared to others in private industry?	
	JD	The fringe benefits from working at this organization are better than one would get in private industry.	
25. Input into work decisions	K6	You feel you have some control of the way work gets done in your area.	65
	K7	You feel you have input into decisions that affect your work.	
26. Organization atmosphere	K8	How friendly is the atmosphere of this organization?	47
	K9	How flexible is this organization when it comes to trying new things?	
	KA	How flexible is this organization in dealing with crisis situations?	
27. Overall satisfaction	M1	How satisfied are you with the persons in your work group?	39
	M2	How satisfied are you with your supervisor?	
	M3	How satisfied are you with your job in general?	
	M4	How satisfied are you with the progress you've made in this organization?	
	M5	How satisfied are you with the respect you get from people you work with?	
	M6	How satisfied are you with your job security?	
	M7	How satisfied are you with the pay you receive for the job you do?	
	M8	How satisfied are you with the opportunities you have to develop your skills?	
	M9	How satisfied are you with your working conditions?	
	MA	How satisfied are you with the communication you have with your supervisor?	
	MB	How satisfied are you with seeing the results of your work?	
	MC	How satisfied are you with the recognition you get for doing a good job?	
	MD	How satisfied are you with the chances you have to see a job through to completion?	
28. Satisfaction with results	MB	How satisfied are you with seeing the results of your work?	62
	MD	How satisfied are you with the chances you have to see a job through to completion?	
29. Satisfaction with job	M3	How satisfied are you with the job in general?	59
	M8	How satisfied are you with the opportunities you have to develop your skills?	
30. Satisfaction with co-workers	M1	How satisfied are you with persons in your work group?	43
	M5	How satisfied are you with the respect you get from people you work with?	
31. Satisfaction with supervisor	M2	How satisfied are you with your supervisor?	58
	MA	How satisfied are you with the communication you have with your supervisor?	
	MC	How satisfied are you with the recognition you get for doing a good job?	

[a]The extent to which the pattern of data in the clusters corresponds to the pattern of the original data.

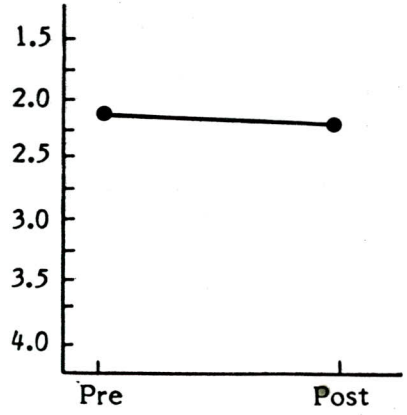
[b]Because of the low reliability of the scale when this item was included, it was excluded from analysis.

Table 6

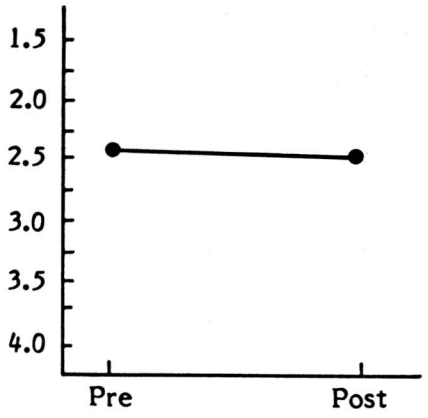
Alpha Coefficients and Pearson Correlations for Attitude Scales

	Attitude Scale	Coefficient[a]
1.	Job involvement	.76
2.	Uninvolvement in job	.63
3.	Doing a good job	.87
4.	Personally care about organization	.72
5.	Organizational commitment	.92
6.	Supervisor support	.92
7.	Supervisor's knowledge of job	.75
8.	Supervisor communication	.85
9.	Positive relation with supervisor	.79
10.	Negative relation with supervisor	.46
11.	Management communication	.85
12.	Management support	.72
13.	Work cooperation	.50
14.	People you work with	.77
15.	Work group cohesiveness	.89
16.	Positive work group relations	.78
17.	Desired work group characteristics	.94
18.	Present work group characteristics	.93
19.	Job accomplishment	.75
20.	Work group effectiveness	.82
21.	Time drags in job	.45
22.	Job ambiguity	.69
23.	Role conflict	.69
24.	Fairness of pay	.65
25.	Input into work decisions	.62
26.	Organization atmosphere	.74
27.	Overall satisfaction	.89
28.	Satisfaction with results	.63
29.	Satisfaction with job	.79
30.	Satisfaction with co-workers	.46
31.	Satisfaction with supervisor	.85

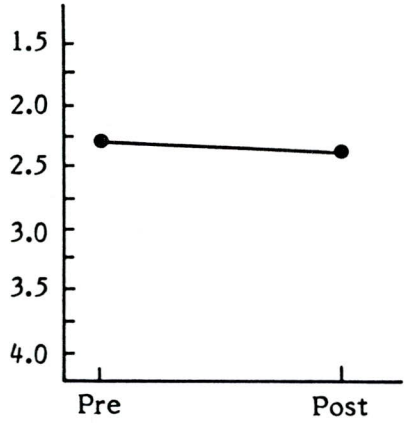
[a]Coefficients were computed using Cronbach's alpha coefficient except for the 11 2-item scales (Nos. 2, 7, 10, 12, 13, 14, 21, 25, 28, 29, and 30), where Pearson's correlations were used.



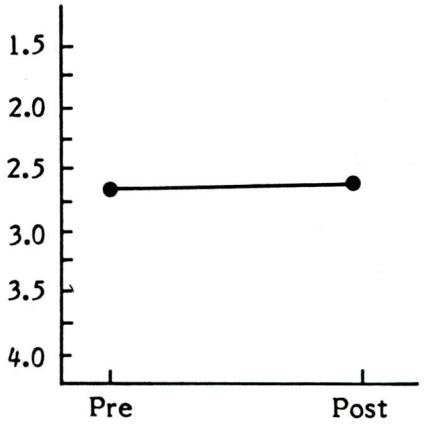
1. Satisfaction with co-workers



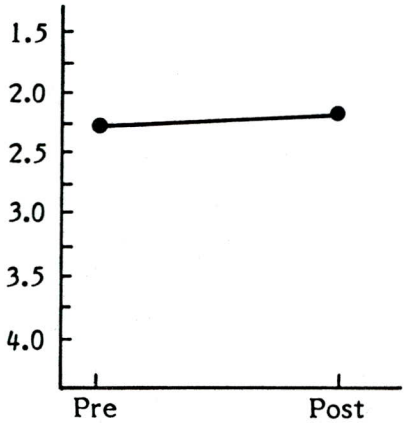
4. Satisfaction with job



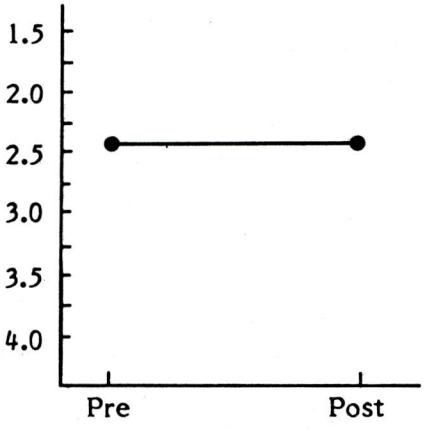
2. Overall satisfaction



5. Satisfaction with supervisor

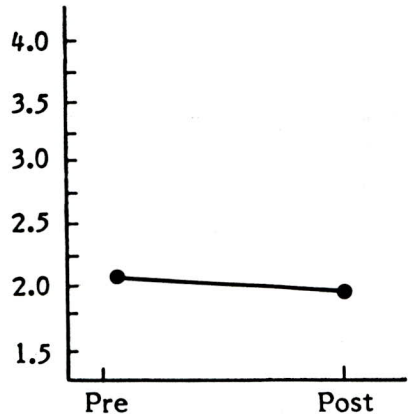


3. Satisfaction with results

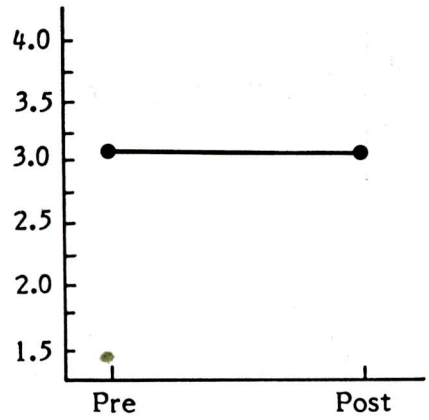


6. Organizational commitment

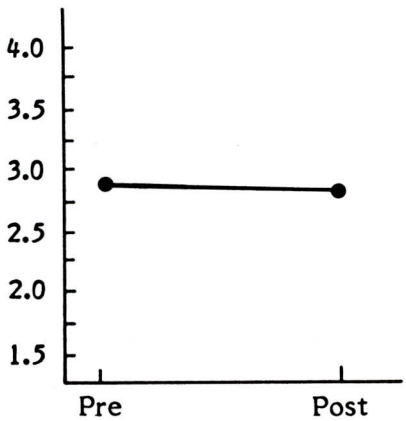
Figures 1-29. Changes in attitudes reported for QC members from pre- to post-QC test administration. Note. An upward sloping line indicates a change in the positive direction.



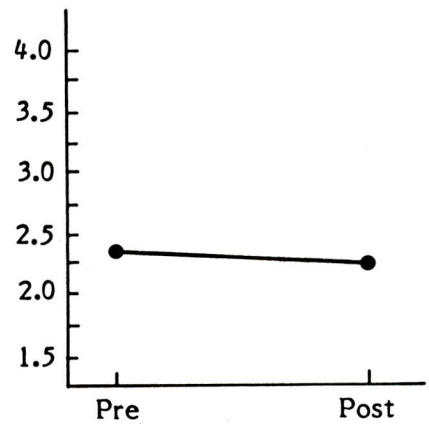
7. Time drags in job



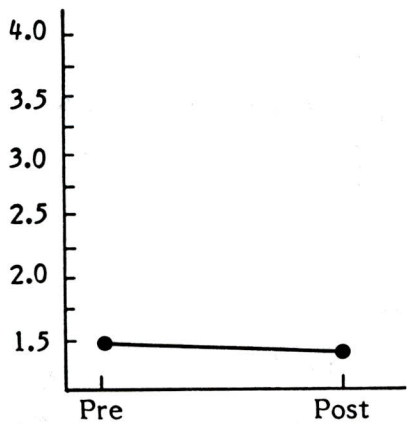
10. Supervisor communication



8. Uninvolvement in job

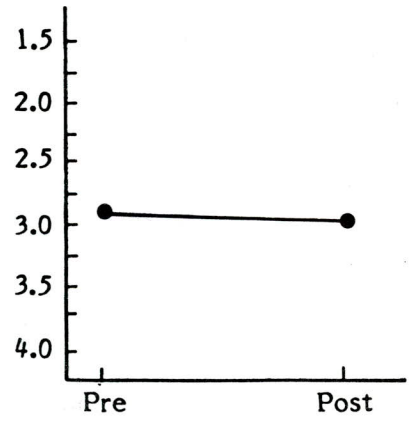


11. Role conflict

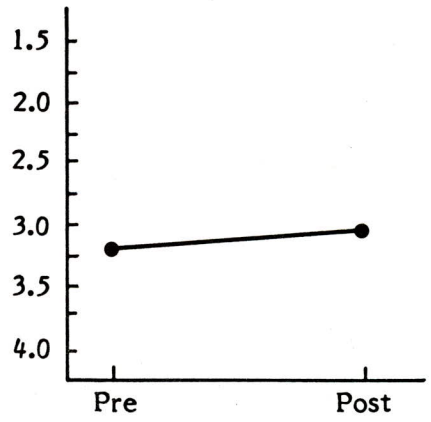


9. Negative relation with supervisor

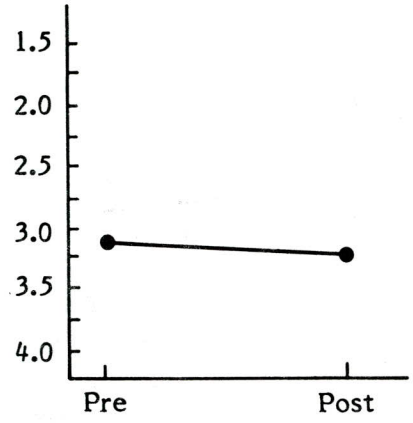
Figures 1 through 29 (Continued). Note. An upward sloping line indicates a change in the positive direction.



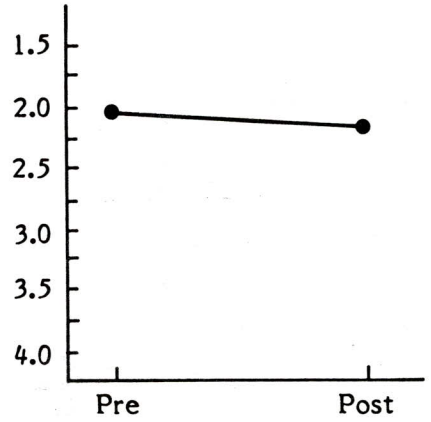
12. Supervisor support



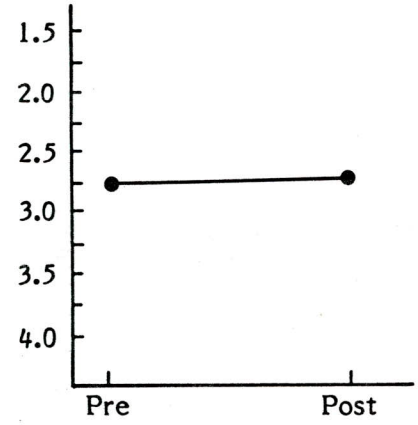
15. Management communication



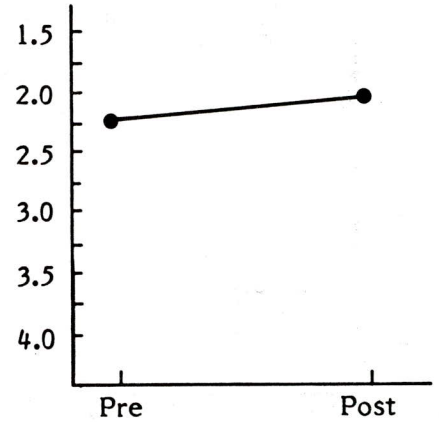
13. Management support



16. Supervisor's knowledge of job

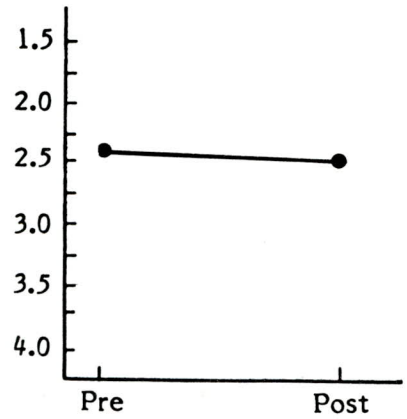


14. Positive relation with supervisor

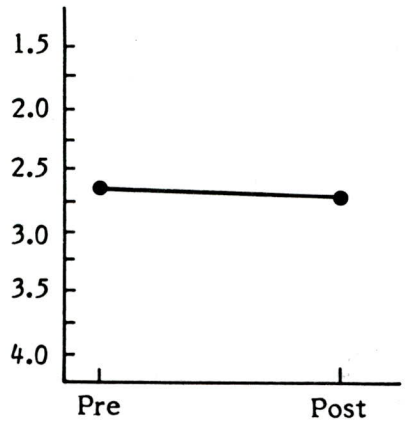


17. Work group effectiveness

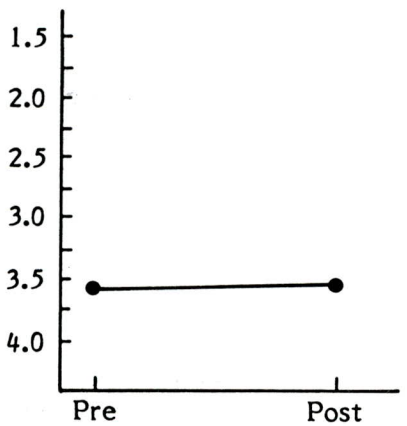
Figures 1 through 29 (Continued). Note. An upward sloping line indicates a change in the positive direction.



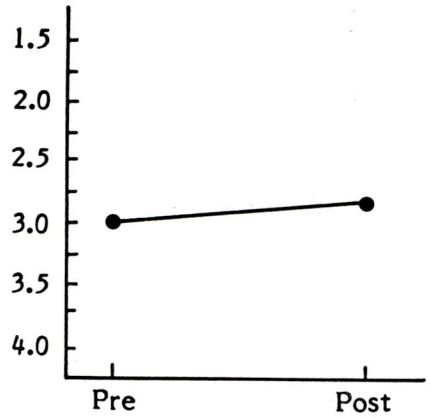
18. Positive relations in work groups



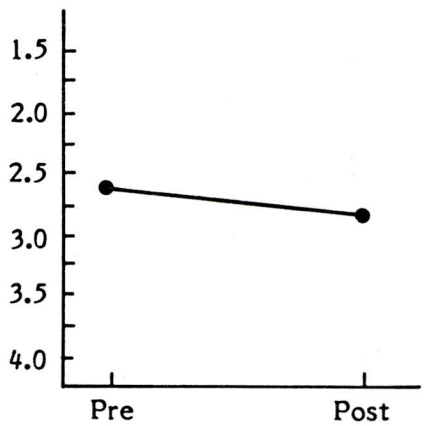
19. Present work group characteristics



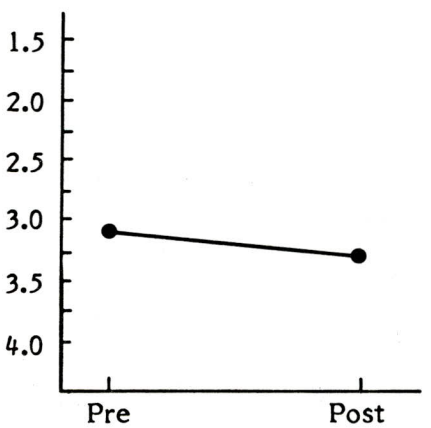
20. Work group cohesiveness



21. Input into work decisions

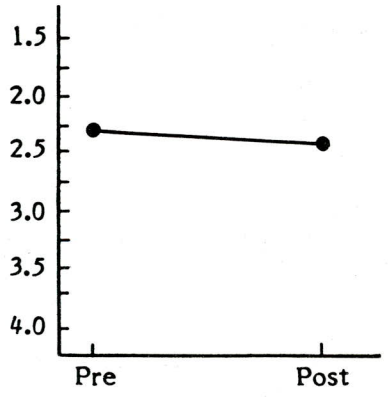


22. Organization atmosphere

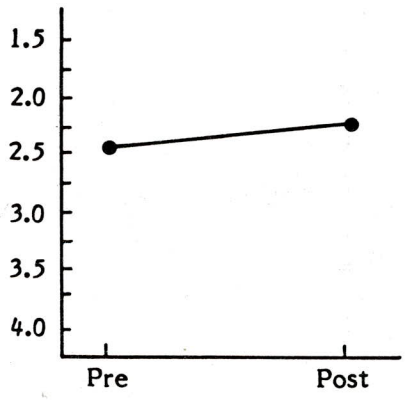


23. Fairness of pay

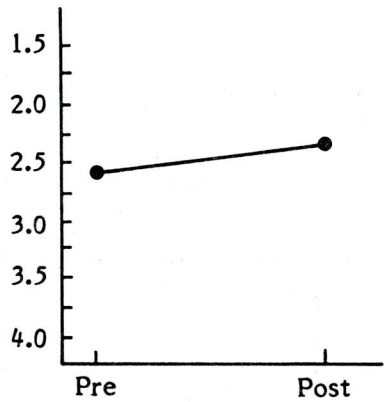
Figures 1 through 29 (Continued). Note. An upward sloping line indicates a change in the positive direction.



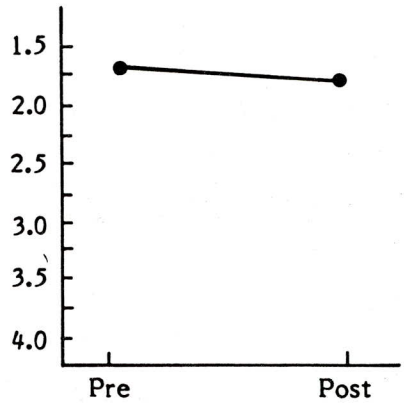
24. Job involvement



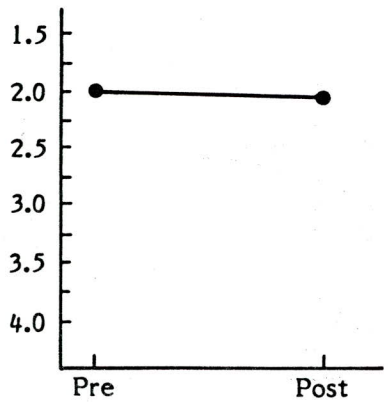
27. Job accomplishment



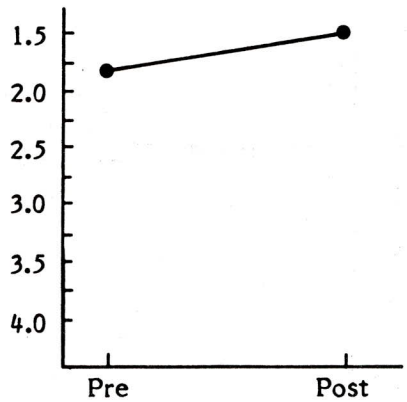
25. Job ambiguity



28. Doing a good job

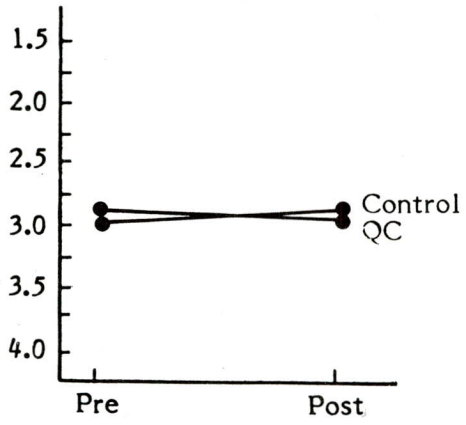


26. Personally care about organization

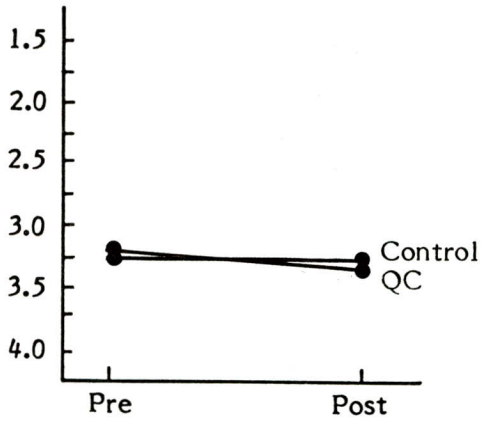


29. Work cooperation

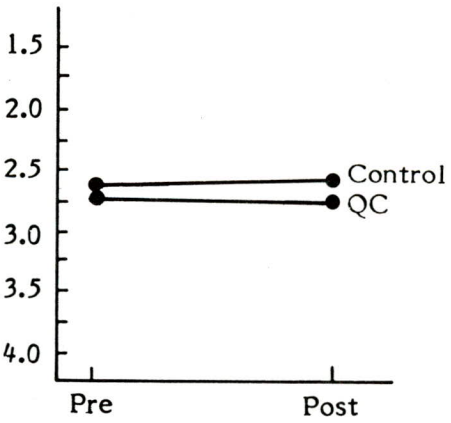
Figures 1 through 29 (Continued). Note. An upward sloping line indicates a change in the positive direction.



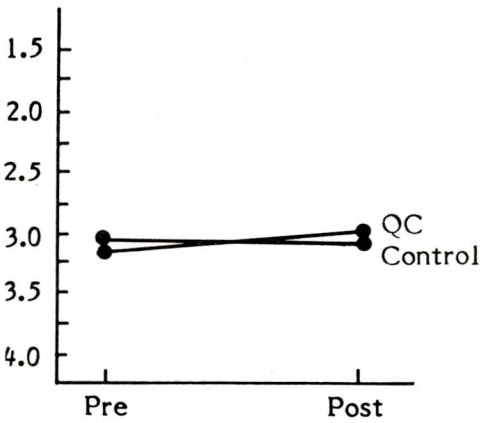
30. Supervisor support



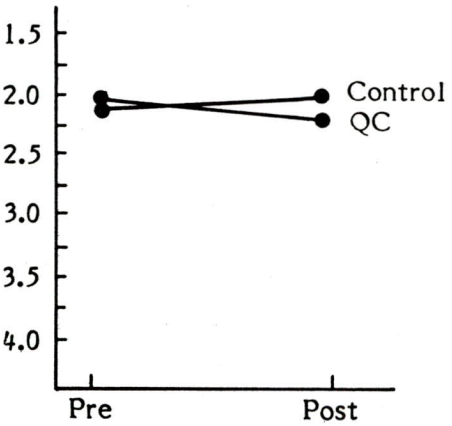
33. Management support



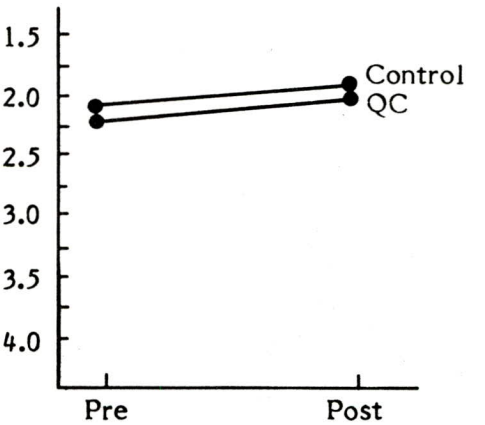
31. Positive relation with supervisor



34. Management communication

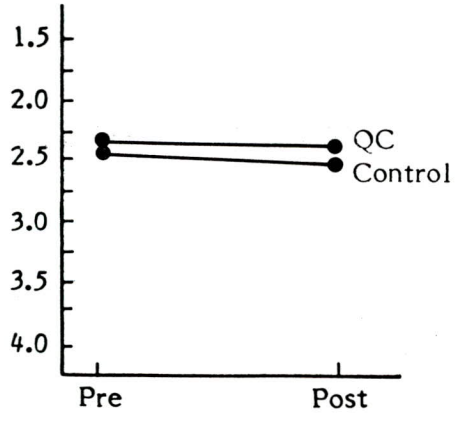


32. Supervisor's knowledge of job

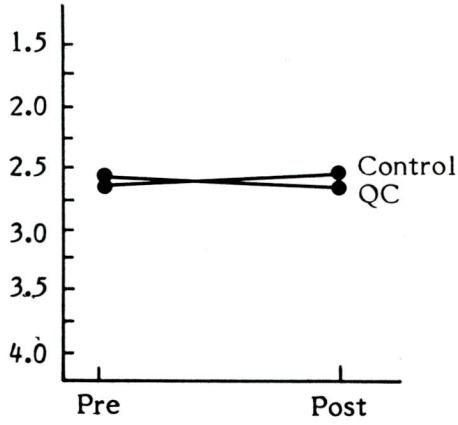


35. Work group effectiveness

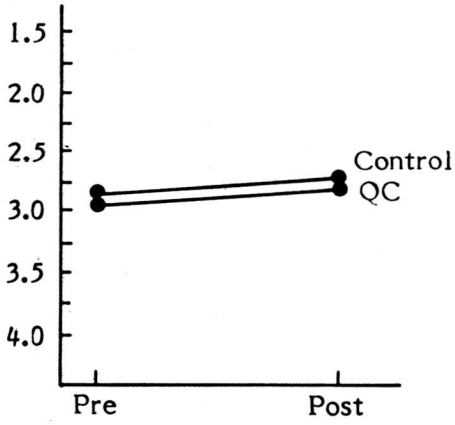
Figures 30-58. Changes in attitudes reported for QC members and QC controls from pre- to post-QC administration. Note. An upward sloping line indicates a change in the positive direction.



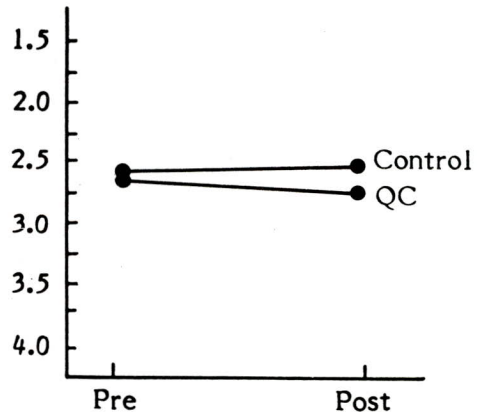
36. Positive work group relations



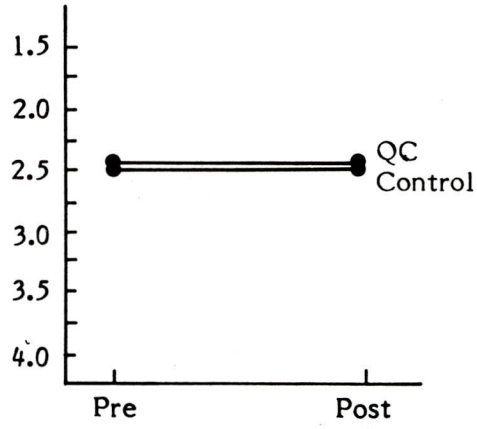
37. Present work group characteristics



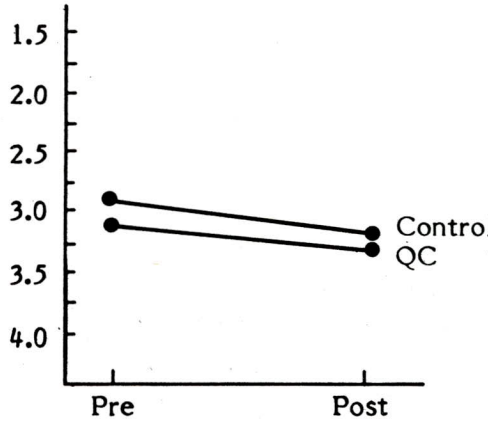
38. Input into work decision



39. Organization atmosphere

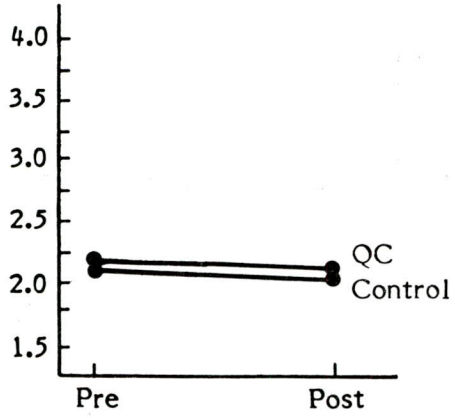


40. Work group cohesiveness

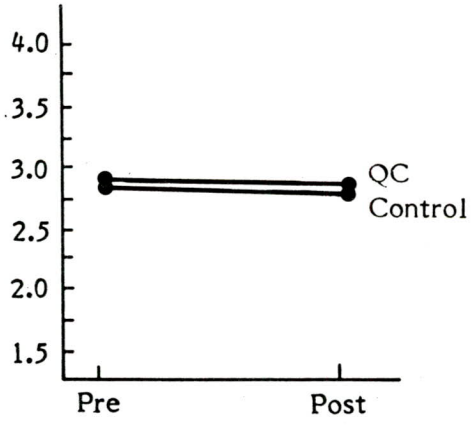


41. Fairness of pay

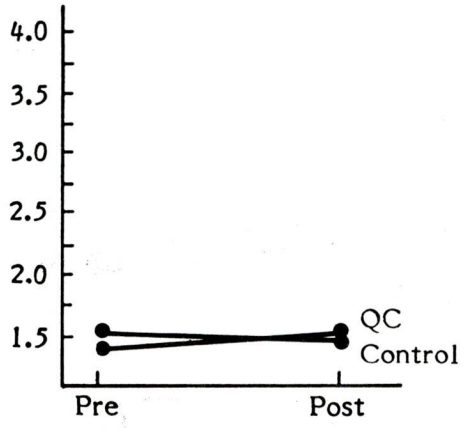
Figures 30 through 58 (Continued). Note. An upward sloping line indicates a change in the positive direction.



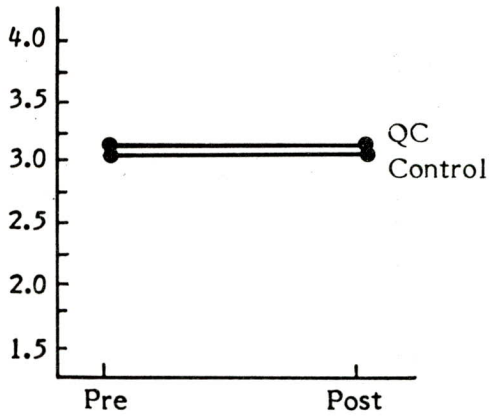
42. Time drags in job



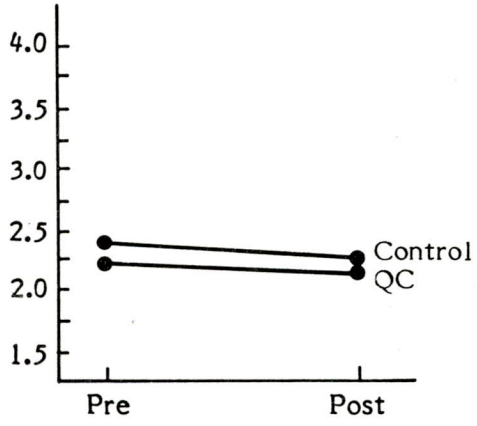
43. Uninvolvement in job



44. Negative relation with supervisor

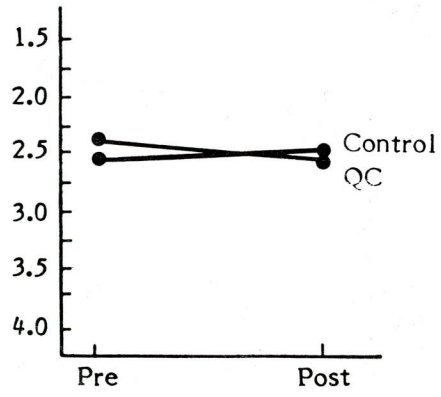


45. Supervisor communication

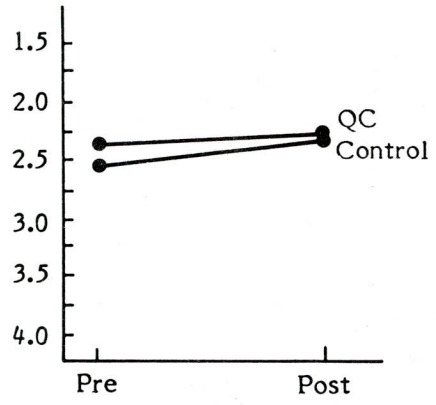


46. Role conflict

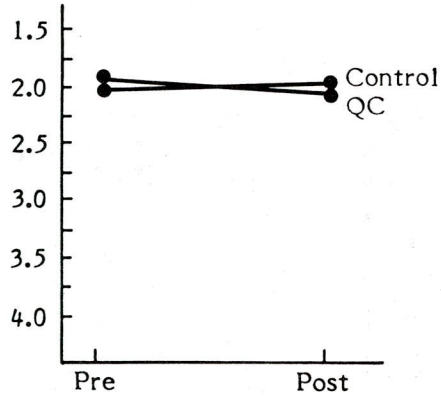
Figures 30 through 58 (Continued). Note. An upward sloping line indicates a change in the positive direction.



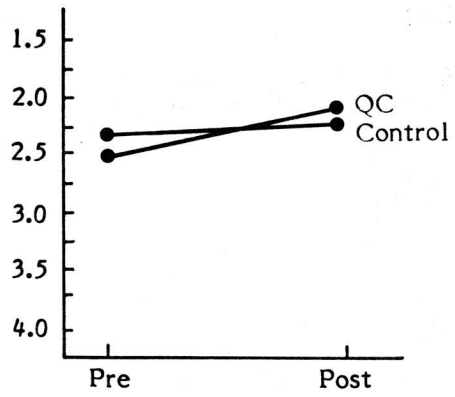
47. Job involvement



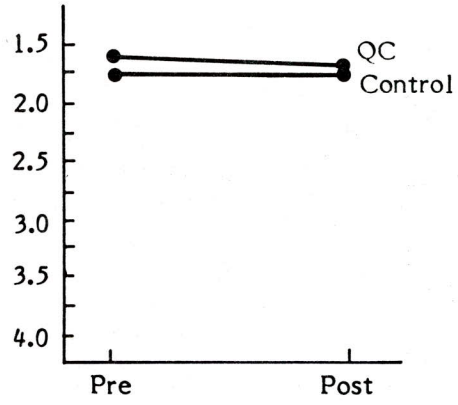
48. Job ambiguity



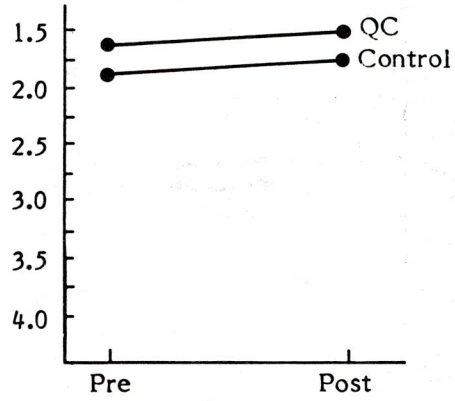
49. Personally care about organization



50. Job accomplishment

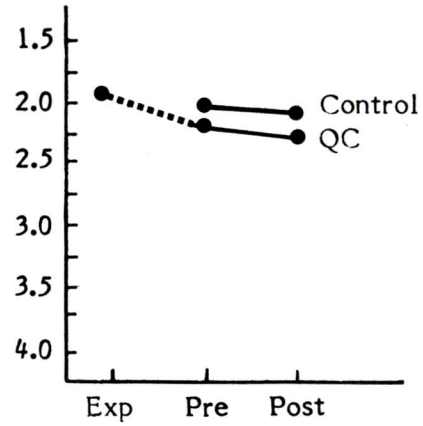


51. Doing a good job

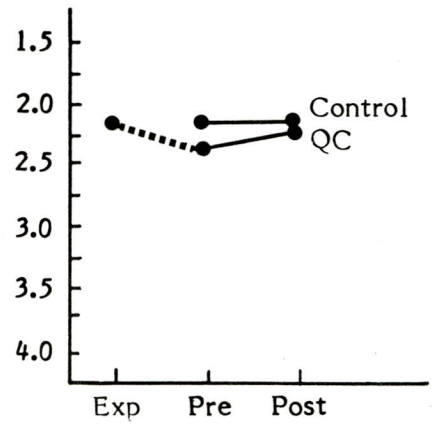


52. Work cooperation

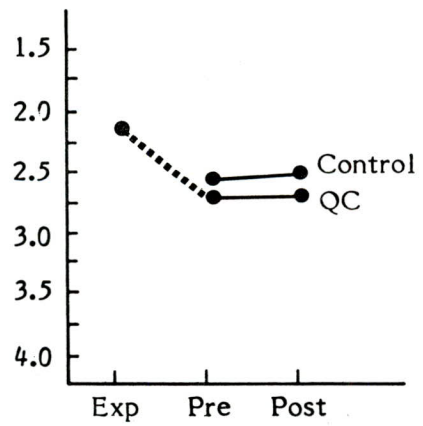
Figures 29 through 58 (Continued). Note. An upward sloping line indicates a change in the positive direction.



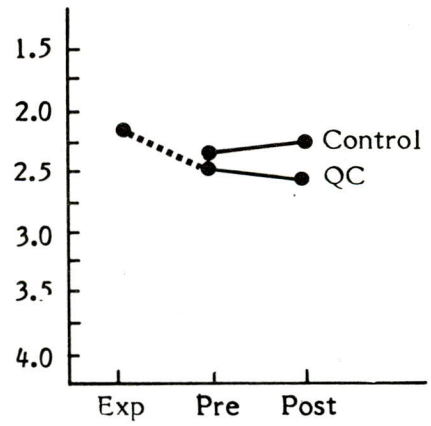
53. Satisfaction with co-workers



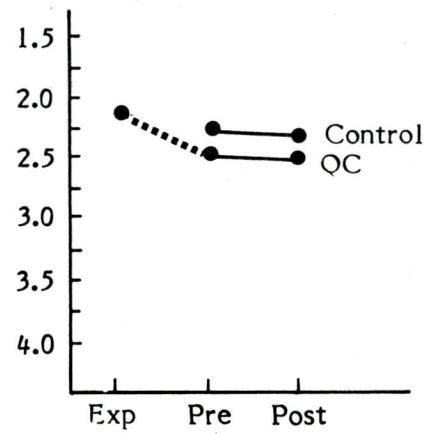
56. Satisfaction with results



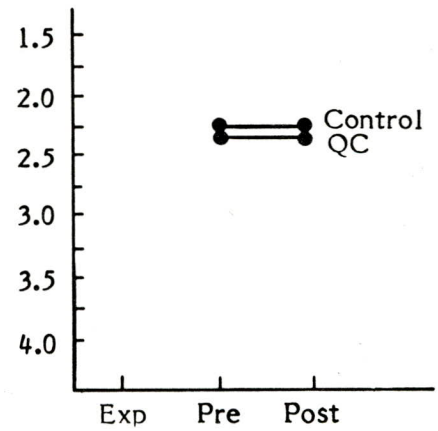
54. Satisfaction with supervisor



57. Satisfaction with job



55. Overall satisfaction



58. Organizational commitment

Figures 29 through 58 (Continued). Note. An upward sloping line indicates a change in the positive direction.

Table 7

Pre- and Post-QC Means for Subjects in QC and Control Organizations on Attitude Scales that Showed Significant Changes Over Time

Attitude Scale	QC Organization Subjects[a]			Control Organization[b] Subjects
	QC Members	Code Controls	Dept. Controls	
1. Job ambiguity:				
Pre-QC mean	2.36	2.28	2.46	2.36
Post-QC mean	2.30	2.26	2.26	2.28
Difference	.06	.02	.20	.08
2. Work group effectiveness:				
Pre-QC mean	2.22	2.15	2.13	1.96
Post-QC mean	2.05	1.97	1.90	1.88
Difference	.17	.18	.23	.08
3. Input into work decisions:				
Pre-QC mean	2.94	2.80	2.77	3.01
Post-QC mean	2.75	2.63	2.86	2.97
Difference	.19	.17	-.09	.04
4. Fairness of pay:				
Pre-QC mean	3.04	2.71	3.03	3.58
Post-QC mean	3.20	3.04	3.23	3.45
Difference	-.16	-.33	-.20	.13

[a]For this table, means for QC controls presented in Figures 34, 37, 40, and 47 were broken into their two components: those for code and department controls.

[b]These means are presented for visual comparison only; they were not included in ANOVAs.

Table 8

Differences in Pre- and Post-QC Means on 43 Selected Questionnaire Items for QC Members and Controls

Item	QC Members	QC Controls
Participation in decisions	-.01	.03
Feeling of accomplishment	-.07	.13
Work group productivity	.08	.16
Work group quality of output	.25	.02
Supervisor encourages participation in decisions	.05	.00
Good work leads to good feelings	-.07	-.11
Personal satisfaction from doing a good job	-.04	-.18
Time drags at work	-.14	.13
Satisfaction with your job	-.02	.08
Personally care about the job	.18	-.16
Adequate communication from supervisor	-.05	-.13
Talk with supervisor about work	.07	-.23
Talk with supervisor about improving work	-.08	-.14
Supervisor shows appreciation for work	-.08	.19
Work group communication	-.15	-.09
Management communicates with employees	-.16	-.17
Top management responds to ideas from below	-.06	.08
Avenues for communicating with department heads has improved	-.16	.29
Positive changes as result of ideas presented to managers by workers	-.05	.37
Work group coordinates efforts	-.05	-.03
Work group makes good decisions/solves problems	.18	.22
Group pride	-.04	-.18
Work group wants to meet objectives	-.06	-.06
A lot of freedom in day-to-day decisions	-.06	.15
Work group cooperation	-.16	-.13
Outside department cooperation	.01	.24
Management interested in employee welfare	-.10	-.08
Top management support in job-related matters	-.07	-.16
Honest communication in work group	-.05	-.13
Work group concerned for you	-.14	-.32
Feel sociable toward your work group	-.05	.02
You have control over how work gets done	.06	.40
Input into decisions	.07	.22
Friendly organization atmosphere	-.03	-.19
Flexible organization	-.09	-.18
Friendly work group	-.04	-.16
People pay attention to what you say	.11	-.06
Work group willing to listen	.01	-.15
Work group members encourage each other	.00	-.07
Work group emphasizes team goal	-.08	.06
Work group members exchange opinions	.06	.02
Work group offers ideas for solving problems	-.02	.05
Satisfaction with persons in your work group	-.14	-.24

Notes.

1. Sample includes only persons from QC organizations who had the same supervisor and were in the same work group at the pre- and post-QC test periods.

2. Negative differences represent an attitude change in a negative direction.

Table 9

Correlations Between QC Membership and Scale Scores for Blue- and White-collar Workers

Scales	Correlations for White-collar Workers (N = 59)		Correlations for Blue-collar Workers (N = 146)	
	Pre-QC	Post-QC	Pre-QC	Post-QC
Job involvement	+.22*	+.18	+.01	-.13
Uninvolvement in job	+.09	+.09	-.03	-.06
Doing a good job	+.06	-.08	+.12	+.11
Personally care about organization	+.15	+.13	-.11	-.25*
Organizational commitment	+.35*	+.25*	-.11	-.15
Supervisor support	+.25*	+.17	-.07	-.09
Supervisor's knowledge of job	+.24*	+.10	-.06	+.03
Supervisor communication	+.13	+.25*	+.02	-.02
Positive relation with supervisor	+.19	+.13	-.07	-.04
Negative relation with supervisor	-.24*	+.11	-.05	-.02
Management communication	+.02	+.21*	-.15*	-.04
Management support	+.13	+.22*	-.06	-.13
Work group cohesiveness	+.22*	+.18	-.16*	-.08
Positive work group relations	+.17	+.14	.00	+.02
Present work group characteristics	+.16	+.08	-.07	-.14*
Job accomplishment	.00	+.13	-.20*	-.19*
Work group effectiveness	+.09	+.24*	-.09	-.13*
Time drags	+.05	-.01	-.05	-.01
Job ambiguity	+.17	+.16	-.15*	-.11
Role conflict	-.11	+.01	-.01	+.01
Fairness of pay	+.12	+.06	-.12	-.07
Input into work decisions	+.12	+.21*	-.17*	-.19*
Organization atmosphere	+.26*	+.13	-.05	-.07
Overall satisfaction	+.10	+.16	-.20*	-.19*
Satisfaction with results	-.04	+.09	-.22*	-.22*
Satisfaction with job	+.08	+.09	-.15*	-.19*
Satisfaction with co-workers	-.14	+.06	-.13*	.12
Satisfaction with supervisor	+.17	+.18	-.13*	-.08

Note. A positive correlation indicates a positive attitude related to QC membership.

*$p < .05$.

Table 10

Means, F-values, and Probabilities for Scales with Significant Differences by Level of Presentation

Scales	Means: No Presentation (N = 45)	Means: Low-level Presentation (N = 19)	Means: High-level Presentation (N = 36)	F	P
Pre-QC Scales:					
Uninvolvement in job	2.50	2.71	2.88*	2.85	.06
People you work with	2.95*	3.61	3.49	2.90	.06
Fairness of pay	3.11	2.44*	3.09	6.01	.00
Work group effectiveness	1.86*	2.42	2.35	7.06	.00
Supervisor communication	2.22	2.55*	2.54	2.56	.08
Management communication	3.30	3.38	3.04*	3.14	.05
Post-QC Scales:					
Supervisor's knowledge of job	2.26	2.13	1.80*	3.62	.03
Positive relation with supervisor	3.00	2.40*	2.53	5.47	.01
Fairness of pay	3.15	2.70*	3.34	3.34	.04
Work group effectiveness	1.74*	2.32	2.03	4.71	.01

Note. Data were not available for five persons.

*Indicates the group with the most positive attitude.

Table 11

Means and Standard Deviations of Sick Leave Usage Within QC Organizations

Subjects	Hours of Sick Leave Usage: 1980 Mean	1980 SD	1982 Mean	1982 SD
QC members	67.65	39.44	64.38	37.34
QC controls	77.93	40.87	72.49	43.47

Table 12

ANOVA Summary Table of Sick Leave Usage Within QC Organizations

Source	SS	df	MS	F	p
QC membership	60.28	1	60.28	2.76	.0988
Error	3498.11	160	21.86		
Sick leave usage	13.53	1	13.53	1.15	.2850
Sick leave X QC membership	.84	1	.84	.07	.7892
Error	1880.54	160	11.75		

Table 13

Data on Organizational Indicators at QC Organizations

	1980				1982			
	QC Members (N = 63)		QC Controls (N = 193)		QC Members (N = 63)		QC Controls (N = 193)	
Indicator	N[b]	%	N	%	N	%	N	%
Promotions	(13)	21	(20)	10	(14)	22	(24)	12
Awards[a]	(10)	16	(15)	8	(15)	25	(41)	21
Beneficial suggestions	(5)	8	(7)	4	(0)	0	(7)	4
Accidents	(7)	11	(26)	13	(8)	13	(26)	13

Note. Ns do not agree with those in Table 4, because data were available (e.g., records) for some subjects who did not complete questionnaires.

[a]The procedures used to recommend employees for awards changed from 1980 to 1982; this could have been responsible for the increase in percentages of awards received in 1982.

[b]Ns have been enclosed in parentheses for ease of comparison.

Table 14

Interview Categories Generated from Interviews at QC Organizations

Category		Subcategory
Individual Attitudes/ Orientation	1.	More interested/positive about work/better attitude
	2.	Higher morale
	3.	Enthusiastic/open
	4.	More commitment
	5.	Lower morale
	6.	Want to do a better job
	7.	No changes
	8.	Confidence/pride/motivation
	9.	Miscellaneous
Communication/ Cooperation	1.	More input
	2.	Improved cooperation
	3.	No changes
	4.	More knowledge
	5.	Improved communication
	6.	Better listening/open-minded
	7.	Negative effects
	8.	Miscellaneous
Organizational Effectiveness	1.	Productivity improvement
	2.	Problems solved/ideas generated
	3.	No changes in effectiveness due to QCs
	4.	Negative impact of QCs
	5.	Miscellaneous
Management/ Supervision	1.	Management responsive/supportive/interested
	2.	Supervision has improved/relationship with supervisor is better
	3.	Supervision is supportive of QCs
	4.	Management is unsupportive
	5.	Managers don't know what's happening in QCs
	6.	Negative attitude toward management
	7.	Supervisors are resistant/feel threatened
	8.	Members treated poorly because in QC; relationship with supervisor is worse
	9.	Management, supervisors are neutral
	10.	Bypassing levels of supervision
	11.	Managers have recognized QC members
	12.	Miscellaneous
Problems	1.	No changes/no or slow progress
	2.	No recognition
	3.	Resistance/nonacceptance from non-QC members
	4.	QC attrition/poor attendance
	5.	Problems concerning QC procedures/techniques in meetings
	6.	Meetings cancelled or interrupted/scheduling problems
	7.	Supervisor or manager inhibits QC
	8.	QC disrupts work
	9.	Problem selection difficulties
	10.	Workload prevents participation in QCs
	11.	Low morale/burnout
	12.	Don't know what QC does
	13.	No money for projects/manning
	14.	Resistance from union or others
	15.	Problems in implementing solutions
	16.	Problems solved without QC presentation
	17.	Miscellaneous
	18.	No problems

Table 14 (Continued)

Category	Subcategory
Attrites' Experience	1. Feel positive about QC experience
	2. Negative experience
	3. No time/too much work
	4. Lack of cooperation from others
Training	1. Training was good/learned a lot
	2. Use skills we learned
	3. Too long; too elementary
	4. Training wasn't adequate
Reasons for QCs	1. To become more efficient
	2. To become more effective or productive
	3. To solve problems
	4. To generate ideas
	5. Worker involvement
	6. Attitude changes
	7. More teamwork
	8. Higher morale
	9. Improved quality
	10. Improve work/work methods
	11. Improve management/labor relations
	12. Better working conditions or quality of work life
	13. Improve communication
	14. Miscellaneous
Long-term Effects	1. Improved morale
	2. Improved productivity
	3. Improved efficiency
	4. More/better communication
	5. QC won't last
	6. Good ideas
	7. Improved motivation
	8. Better quality
	9. Improved working conditions
	10. Problem-solving
	11. Worker involvement
	12. QC program expansion
	13. Better managers/supervisors
	14. None/don't know
	15. Miscellaneous
Comparisons of QCs and Other Programs	
Time	
Skills/Abilities	

Table 15

Percentage of Responses in Selected Interview Categories by QC Organizations and Type of Emplyee

	Subcategory	QC Organization 3	2	1	Type of Employee Blue-collar	White-collar	Manager	Total % by Category	Total Frequency by Category
1.	More interested/positive about work/better attitude	47	21	45	47	39	24	40	40
2.	Higher morale	12	14	0	7	11	16	10	10
3.	Enthusiastic/open	4	25	14	2	28	24	12	12
4.	More commitment	0	0	14	2	0	8	3	3
5.	Lower morale	6	21	0	16	0	0	9	9
6.	Want to do a better job	6	7	0	9	0	0	5	5
7.	Confidence/pride/motivation	16	4	14	12	17	8	12	12
8.	Miscellaneous	10	7	14	7	5	20	10	10
	Total %	101	99	101	102	100	100	101	
	Total frequency	51	28	22	58	18	25		101
	Communication/Cooperation								
1.	More input	17	18	4	13	6	24	14	34
2.	Improved cooperation	29	22	44	28	35	30	30	73
3.	No changes	6	4	7	6	2	6	5	13
4.	More knowledge	7	8	19	12	14	2	10	25
5.	Improved communication	31	41	18	30	37	28	31	76
6.	Miscellaneous	8	4	2	6	2	6	5	13
7.	Better listening/open-minded	2	1	3	2	4	0	2	5
8.	Negative effects	0	3	3	2	0	4	2	4
	Total %	100	100	100	99	100	100	99	
	Total frequency	108	78	57	142	51	50		243
	Organizational Effectiveness								
1.	Productivity improvement	39	34	35	40	50	27	36	60
2.	Problems solved/ideas generated	24	34	24	24	19	34	27	45
3.	No changes in effectiveness due to QCs	17	17	26	20	19	17	19	31
4.	Negative impact of QCs	1	7	0	6	0	0	3	5
5.	Miscellaneous	19	8	15	10	12	22	15	34
	Total %	100	100	100	100	100	100	100	
	Total frequency	72	59	34	90	16	59		165
	Management/Supervision								
1.	Management responsive/supportive/interested	50	11	46	23	58	46	34	77
2.	Supervision has improved/relationship with supervisor is better	13	1	4	4	0	12	6	14
3.	Supervisor is supportive of QCs	5	6	9	5	5	9	6	14
4.	Management is unsupportive	7	32	0	24	0	3	15	33
5.	Managers don't know what's happening in QCs	1	2	7	2	5	5	3	7
6.	Negative attitude toward management	0	6	7	6	0	1	4	9
7.	Supervisors are resistant/threatened	6	22	8	13	10	12	13	28
8.	Members treated poorly because in QC; relationship with supervisor worse	0	1	4	1	11	0	1	3
9.	Management, supervisors are neutral	8	0	13	5	11	8	6	14
10.	Bypassing levels of supervision	0	5	2	3	0	1	2	5
11.	Managers have recognized QC members	5	0	0	3	0	0	2	4
12.	Miscellaneous	6	13	0	11	0	3	7	16
	Total %	101	99	100	100	100	100	99	
	Total frequency	85	85	54	128	19	77		224
	Problems								
1.	No changes/no or slow progress	8	4	7	7	5	6	6	17
2.	No recognition	0	1	1	1	0	1	1	2
3.	Resistance/nonacceptance from non-QC members	14	15	7	13	9	10	12	32
4.	QC attrition/poor attendance	11	12	10	13	19	1	11	29
5.	QC procedures/techniques in meetings	4	0	5	4	5	0	3	8
6.	Meetings canceled or interrupted/scheduling problems	3	13	11	9	9	7	9	23
7.	Supervisor or manager inhibits QC	2	6	5	6	5	1	4	11
8.	QC disrupts work	7	10	12	7	5	17	9	25
9.	Problem selection difficulties	4	8	11	7	0	10	8	20
10.	Workload prevents participation in QCs	11	6	9	9	14	7	9	23
11.	Low morale/burnout	2	1	4	2	0	3	2	6
12.	Don't know what QC does	8	1	4	4	14	3	4	12
13.	No money for projects/manning	1	5	2	1	0	7	3	7
14.	Resistance from union or others	6	2	0	1	0	9	3	8
15.	Problems in implementing solutions	4	1	0	2	0	1	2	5
16.	Problems solved without QC presentation	2	0	4	3	0	0	2	5
17.	Miscellaneous	14	12	6	10	9	13	11	29
18.	No problems	1	1	0	0	5	1	1	2
	Total %	102	99	100	99	99	97	100	
	Total frequency	102	82	80	174	21	69		264

Table 16

Estimated Hours per Week QC Members Spent on QC Activities Outside of QC Meetings

QC Members at Organization 1 (N = 3)	QC Members at Organization 2 (N = 5)	QC Members at Organization 3 (N = 9)
0.15	0.50	0.25
0.25	1.00	0.38
0.75	1.62	1.00
	2.00	1.00
	5.00	1.50
		2.00
		2.50
		2.50
		12.00

Note.

Mean = 2.02.
Median = 1.00.
Mode = 1.00.

Table 17

QC-process Documentation Summary

QC	Time frame	No. meetings	Members: Type worker	Members: Maj. gender	Members: $\bar{X}$ Age range	Members: $\bar{X}$ Attendance (%)	Members: Attrition ratio	Members: No. new members	Management Presentations: Number	Management Presentations: Topic(s)	Solution implemented?	Projected savings ($K/Yr.)	QC members who are supervisors	QC leader also a supervisor?	No. workers in QC code
QC Organization 1[a]															
A	10/81 to posttest	30	White-collar	F	41-50	84	1/7	0	1	Efficiency	Partially	None	3	No	44
B	2/82 to posttest	19	White-collar	F	41-50	36	1/7	1	0[b]	Training procedures	Yes	None	1	No	25
C	8/81 to 6/82	20	White-collar	M	41-50	70	QC Terminated	--	1	Safety	No	None	3	No	105
QC Organization 2															
A	10/81 to posttest	18	White-collar	F	31-40	76	3/10	2	1	Quality, Efficiency	Yes	None	3	No	40
B	10/81 to 12/81	10	Blue-collar	M	41-50	94	QC Terminated	--	1	Quality, Efficiency	Yes	None	1	No	21
C	10/81 to 12/81	11	White-collar	F	31-40	91	QC Terminated	--	1	Efficiency	Yes	None	1	Yes	10
D	9/81 to posttest	24	Blue-collar	M	31-40	86	4/8	6	1	Safety	Yes	None	1	No	26
E	12/81 to posttest	27	Blue-collar	M	31-40	83	3/8	8	0[b]	Training procedures, Efficiency	Yes	None	1	Yes	69
F[c]	1 /81 to 3/82	11	Blue-collar	M	31-40	89	6/10	2	0	--	--	--	1	No	20
QC Organization 3															
A	10/81 to posttest	22	Blue-collar	M	31-40	73	5/10	1	0[b]	Training, Efficiency	Yes	None	1	Yes	600
B	10/81 to posttest	43	Blue-collar	M	31-40	92	0/7	1	1	Efficiency, Quality	Yes	36	1	Yes	350
C	10/81 to posttest	34	Blue-collar	M	21-30	89	4/9	4	1	Training	Yes	None	2	Yes	600
D	10/81 to posttest	33	Blue-collar	M/F	31-40	82	3/12	2	1	Inventory control	Yes	40	2	Yes	200
E	10/81 to 6/82	21	Blue-collar	M	31-40	100	1/10	0	1	Safety. Efficiency	Yes	14	1	Yes	900
F	10/81 to posttest	33	Blue-collar	M	31-40	81	3/8	3	1	Efficiency	Yes	212	1	Yes	75

[a]There were originally six QCs at this organization; however, three QCs, in the same department as QC A, terminated early in the program, primarily due to heavy workload schedules.

[b]Presentations are not necessary for QC solutions prior to implementation.

[c]Combined with QC E in April 1982.

CONCLUSIONS AND RECOMMENDATIONS

A multimethod approach was used in this study to assess the impact of QCs on both individuals and the organization. The approach included the use of questionnaires, indicators of organizational well-being (archival records), interviews, and documentation of QC activities. While much of the data were straightforward and consistent across methods, there were discrepancies in some areas. The consistent findings are relatively easy to report and explain. The challenge is reconciliation of divergent outcomes among the sources. This section first discusses the straightforward results and then explains the more divergent results.

The results of the expectation assessment suggest that QC volunteers expect many positive outcomes to result from QCs, such as problems being solved and their jobs being made easier. The results also indicate that, at the time members volunteer, they report relatively high levels of satisfaction on a number of dimensions. In general, expectations of outcomes from QCs are positive and these may have influenced overall reports of satisfaction with the job. Although satisfaction was high at the time expectations were measured, it did not stay high for long. At the conclusion of QC training, 8 weeks later, satisfaction was measured again with the same items and QC members' satisfaction had dropped off to a level even below that of the control group. The prospect of QCs appears to be associated with high expectations and high levels of satisfaction--higher than those reported after the reality of QCs had been experienced. This may be explained by a phenomenon described by Hespe and Wall (1976), who suggested that the opportunity for participation may artificially raise people's expectations. It may be that, after training, respondents felt that their expectations were not going to be realized. This disillusionment may have served to reduce their reported satisfaction. It is also possible that the way QC expectation questionnaire items were presented exacerbated the effects of elevated expectations on reports of satisfaction. Examination of the questionnaire showed that the items that measured job satisfaction immediately followed a question that asked respondents what they expected the most likely positive outcomes of QCs to be. This could have alerted them to the positive expectations they had of QCs and, in turn, elevated their levels of reported satisfaction.

This discrepancy between expectations and later satisfaction has implications for the method in which QCs are introduced to prospective volunteers. Individuals should be given a realistic picture of what to expect rather than false expectations. Although false expectations may initially encourage volunteers, they may also contribute to disillusionment when those expectations are not realized.

The findings concerning blue- and white-collar workers' reactions to QCs are also interesting. Blue-collar involvement in QCs is associated with negative attitudes, while the opposite is true for white-collar workers. Previous research (Penn, Sheposh, Riedel, & Young, 1980) has revealed that the most important motivator for blue-collar workers is to have materials and equipment available to do their jobs. For the most part, it appears that blue-collar workers like their trades and want to do the work. Hespe and Wall (1976) have shown that those who express the most satisfaction with their jobs desire the least involvement or participation in decision making. It may be that the blue-collar workers who expressed the most positive attitudes toward their jobs were not interested in leaving them to get involved in QC activities. The types of things QCs do are likely to be very different from normal blue-collar job activities. Those with less positive attitudes may have been more willing to try something new and may have joined QCs with the expectation of making improvements.

For white-collar workers, QC-type work is not vastly different from the type of work they normally do. White-collar workers may be more positive toward QC-type activities (e.g., meetings and problem-solving sessions) because they recognize them as methods that could be useful. Those who like their jobs may be more likely to engage in similar type activities, while those who are negative may have no interest in being involved. It has also been suggested that white-collar workers have a stronger identification with management than do blue-collar workers. If QCs are perceived as being valued by management, those white-collar workers with stronger identification with management would be more likely to want to participate. This reasoning is conjecture, but it does seem that blue- and white-collar workers who want to participate have different attitudes and perceptions about their jobs. This issue should be considered by those who attempt to implement QCs in different areas, as well as by those who manage circles and respond to recommendations. If blue-collar QC members are the most disgruntled members of their work group, then dissatisfaction with QCs could exacerbate these negative feelings. Special care should be taken to make QC involvement a positive experience for these less positive workers.

One of the potential consequences of a multimethod approach is that results may not be entirely consistent. According to Jick (1979, p. 607), "When different measures yield dissimilar results, they demand that the researcher reconcile the differences." Assessments of subjective changes are particularly sensitive to discrepancies across methods. In this study, the interview data suggest that people's attitudes and perceptions did change, but the questionnaire data indicate that they did not.

It is difficult to reconcile the discrepancies between the interview and the questionnaire data. Almost all of the individuals involved in QCs at the time the interviews were conducted had participated in the pre- and post-QC attitude assessment. Almost all of the blue- and white-collar workers interviewed were circle members; only a small number were controls or attrites. Contrary to expectations, their interview responses were not verified by the questionnaire data. For the most part questionnaire measurements showed that no changes occurred in QC members' perceptions of communication, cooperation, or morale factors. The analyses of individual questionnaire items even suggest some changes in negative directions, contrary to the responses given in the interviews. The questionnaire results were also surprising in that they were in contrast to results from the popular literature that has acknowledged improvements in job attitudes and satisfaction as outcomes to participation in QCs.

These findings have many possible explanations, which involve features of the study, features of the instruments and/or characteristics of the individuals measured. A partial explanation may be that the interviews primarily tapped reactions to QCs themselves (i.e., working relations among QC members, attitudes about involvement in QCs, communication among QC members), whereas the questionnaires assessed changes in more general perceptions of job characteristics and job attitudes. Another explanation may be that changes did, in fact, take place but not to the extent that they influenced questionnaire responses. For example, when people were asked to indicate levels of satisfaction on a five-point scale, their levels may have increased but not enough to change their responses on the scale.

It is not likely that the questionnaire instrument was too insensitive to pick up meaningful effects. First, most items were taken from previously used and factor-analyzed scales. Reliability tests run on the scales indicated fairly high internal consistency. Second, although not relevant to this study, the analyses of responses of high- versus low-job-involved persons revealed many significant differences in attitudes

and perceptions. These differences are consistent with previous research, and the sample sizes in the high-and low-involvement groups are even smaller than those used for many of the QC versus non-QC comparisons. This provides evidence that, when differences do exist, the instrument is able to detect them.

If, on the other hand, the instrument was sensitive enough to detect changes, why were the interviews indicative of change while the questionnaires were not? One explanation for the interview effects, given earlier, is that individuals respond specifically to their QC experience, which does not influence more general job attitudes. Another factor that should be considered concerns the interview method itself. There is some research evidence to indicate that the face-to-face exchanges between individuals in an interview can influence their responses (Cannell, Fowler, & Marquis, 1968). Goffman (1969), in a discussion of the role of subtle expectations among persons in interviews, has shown that participants desire approval and positive interactions. These concerns are more relevant in group interviews, as individuals who speak out are influenced not only by what they think the interviewer wants to hear but also by what they think will be accepted by the others being interviewed. These types of effects could have caused those interviewed to exaggerate the extent of their attitude changes. The responses to the questionnaire are not susceptible to these group influences. In summary, it is concluded that the questionnaire is an adequate instrument with which to assess general attitudes and perceptions about one's job.

Particular features of the study may provide some understanding as to why there were no changes. The time frame for this study was approximately 1 year for most of the QCs. Given 2 months for QC training, the time between the pre- and post-QC attitude questionnaire was about 10 months. This may not have been sufficient time for individual or organizational changes to take place. Changes that result from organizational interventions can require up to 5 years to be fully realized. While the time frame of this study may have been sufficient to assess changes in sick leave and attitudes toward the program, they may not have been sufficient to develop attitude changes. Organizational changes often precede attitude changes and only a small number of QC solutions were implemented before the post-QC test was administered. These changes may have been too minor or too recent to result in attitude changes.

In a number of instances, the QC leaders were not the work group supervisors. This fact may have limited the opportunity of QC members to develop new patterns of communication, which may have resulted in no perceived changes by the members. It is also possible that this deviation from accepted QC operation decreased the potential for other positive changes to occur.

Another factor that may have contributed to the lack of perceived changes was the number of non-QC individuals in the QC work area, coupled with the fact that each QC was the only one in its code. When the QC members dispersed from their QC meetings, they worked among people who were not QC-trained, and, as was shown by interview data, were not really aware of what was going on that was relevant to QC activities. Thus, when QC member interviewees said they had experienced positive changes in work group relations, it is likely that they were referring to their QC work group. The questionnaire items were directed to QC members who also worked with non-QC individuals. The questionnaire responses indicate no changes occurred in work group relationships on the job. This is analogous to the problem employees encountered when they went to sensitivity training in the 1960s. Those people who participated in the training increased their interpersonal sensitivity but had difficulty transferring their learning into the work setting where others had not been similarly trained (Bennis, 1963).

In considering the differences between findings of this study and those of past research concerning the effects of QCs, one should keep in mind the methodological flaws in these studies (discussed on page 2) and the frequent use of testimonials as indications of change. Generalizations should not be made from testimonials about changed attitudes, nor should the reactions to QC experiences be taken as indicators of more positive overall job attitudes. QCs and related QC activities are only a small portion of an employee's working life. It may be overly optimistic to expect that such a program would have a sizeable impact on employee attitudes, perceptions, or job performance. It should not be concluded, however, that because QCs do not significantly impact these areas, they are useless. Quite the contrary is true. QCs are useful, but managers should have more realistic expectations of their potential. QCs will not solve an organization's morale and productivity problems, but they may solve more specific job-related problems and promote more effective communications.

While interview responses should be viewed cautiously as indicators of attitude changes, they are quite useful for suggesting areas worthy of attention in future QC implementation and evaluation efforts. First, the interview responses regarding training indicate that respondents felt the QC training was a worthwhile experience; they had learned communication and problem-solving skills useful to them on the job. This suggests that, whether or not QCs are implemented or whether or not they survive, the principles and skills acquired in training are worthwhile. Second, the number of problems solved by these QC groups should be taken as an indication of QC successes. Almost every circle that identified and solved problems and generated solutions had them implemented at the conclusion of the study.

The interviews pinpoint potential areas managers should be aware of in attempts to implement and operate QCs. Especially noteworthy examples are nonsupport or resistance from supervisors, managers, or co-workers, and workload conflicts. One manager commented that he thought the QC was usurping power; several non-QC members were disgruntled because they did not know what QCs were doing but they did know QCs were disrupting their work. To be maximally effective, QCs must be incorporated into the organization in ways that minimize these types of potential problems. For example, supervisors need to be well indoctrinated into the QC process so that they do not feel threatened, and time and resources must be allocated for QC activities to ensure adequate publicity. Also, care must be taken to plan QC meetings to minimize work disruption.

Initial feasibility studies provide one avenue than can be used to minimize problems that result when new programs are introduced to an organization. The need for such studies prior to even considering an organizational intervention has been emphasized by Blair, Cohen, and Hurwitz (1982), Lorsch and Lawrence (1968), and Metz (1981a, 1982b). Lorsch and Lawrence (1968) observed that "in many of the current change efforts, the emphasis seems to be on action and there tends to be a general action program which the change agent will apply to any organization regardless of its specific problems" (p. 273). The three QC organizations in this study did not conduct feasibility studies or diagnosis of any type. Attention to this procedure might have signaled the problems that surfaced in this study. The most specific and prominent problem was the heavy workload at each activity. Members and nonmembers alike commented that the workload in their respective areas was so heavy that some QCs stopped meeting or some members could not attend. In some instances, supervisors were responsible for cancelling meetings due to the workload. Other factors that should have been considered were the receptiveness of middle management, worker-supervisor relations, organizational climate, and upper management's objectives and level of support.

Metz (1981a, 1981b) observed that diagnosis is necessary prior to implementation of QCs in order to assess (1) managerial and organizational readiness, (2) start-up and implementation requirements, and (3) broader implications of QCs to the organization. Disregard of managerial and organizational readiness in this study may have resulted in the forced acceptance of QCs and consequent low levels of support by some supervisors and managers.

Start-up and implementation requirements should include time and money for employee orientations and training, QC meetings, QC activities, and QC presentations, as well as solution implementation. There should also be sincere interest and observable support from all levels of management. Implementation should not begin until these requirements are met.

Consideration should also be given to the implications of a QC philosophy. If QCs are adopted, it will mean that workers will be engaging in more participative behavior than previously sanctioned or observed. New lines of communication may be opened and top management may find organizational change materializing from the "bottom-up" rather than from the usual "top-down" fashion. Metz (1981b) has encouraged the use of diagnosis to gain understanding about the gap between the state of the organization and how various elements within the organization must respond if the QC process is to work. A gap could exist, for instance, if management were highly autocratic. This style is incompatible with the participative nature of QCs.

Also, individuals should be aware of how QCs will affect their roles and responsibilities. Gryna (1981) who studied the QCs at 11 major United States corporations, was surprised at the lack of feasibility work conducted prior to the implementation of QCs. He observed that some middle- and upper-management personnel do not understand their responsibilities toward the QCs; they were not even aware that they had to release their personnel from work so that they could attend meetings.

As a final comment, organizational diagnosis may reveal that the state of the organization is not suitable for QCs. It may also reveal that the organization's needs cannot be met with QCs. If either is the case, other strategies should be considered to improve the health of the organization. QCs should not be considered as cures, nor should they be considered as "can't hurts." They require substantial investments of time, money, and behavioral support. The feasibility, applicability, and potential gains should be carefully considered before commitments are made to implement QCs in any organization.

REFERENCES

Amsden, R., & Amsden, D. A. Results of research on quality circles. American Society of Quality Control Technical Conference Transactions, 1980, 34, 712-717.

Atwater, L. Quality circles in the Navy: Productivity improvement or just another program? (NPRDC Spec. Rep. 81-21). San Diego: Navy Personnel Research and Development Center, July 1981. (AD-A101 873)

Bennis, W. G. New role for the behavioral sciences: Effecting organizational change. Administrative Science Quarterly, 1963, 8, 125-165.

Blair, J. D., Cohen, S. L., & Hurwitz, J. V. Quality circles: Practical consideration for public managers. Public Productivity Review, 1982, 9-18.

Bryant, S., & Kearns, J. Workers' brains as well as their bodies: Quality circles in a federal facility. Public Administration Review, 1982, 42(2), 144-150.

Campbell, J. P., & Beaty, E. E. Organizational climate: Its measurement and relationship to work group performance. Proceedings of the 79th Annual Convention, The American Psychological Association, Washington, DC: September 1971.

Cannell, C. F., Fowler, F. J., & Marquis, K. H. The influence of interviewer and respondent psychological and behavioral variables on the reporting in household surveys (National Center for Health Statistics, Series 2, No. 26). Washington, DC: U. S. Department of Health, Education and Welfare, 1968.

Cummings, T., & Molloy, E. Improving productivity and the quality of work life. New York: Praeger Publishers, 1977.

Donovan, J., & Van Horn, B. Quality circle program evaluation. Transactions of the Second Annual International Association of Quality Circles Conference, 1980, 96-100.

Franklin, J. L. A path analytic approach to describing casual relationships among social psychological variables in multi-level organizations (TR No. 0014-67-A-081-0013). Ann Arbor, MI: University of Michigan (Institute for Social Research, November 1973.

Franklin, J. L. The Survey of Organizations. Ann Arbor, MI: University of Michigan, (Institute for Social Research: Rensis Likert Association, Inc.), 1980.

Georgopoulos, B. A., & Mann, F. C. The community general hospital. New York: Macmillan, 1962, 1-88, 500-543.

Goffman, E. Strategic Interaction. Philadelphia: University of Pennsylvania Press, 1969.

Goodfellow, M. Quality control circle programs--What works and what doesn't. Manufacturing Engineers, 1981, 70-72.

Guest, R. H. The Sharonville story: Worker involvement at a Ford Motor Company plant. In R. Zager & M. Rosow (Eds.), The Innovative Organization. New York: Pergamon Press, Inc., 1982.

Gryna, F. M., Jr. Quality circles: A team approach to problem solving. New York: Amacon, 1981.

Harper, S. The utility of quality circles in United States manufacturing companies (Report No. 0014-82-C-0139). Office of Naval Research, 1982.

Hespe, G., & Wall, T. The demand for participation among employees. Human Relations, 1976, 29(5).

Horn, L. Effect of quality circles on productivity attitudes of Naval Air Rework Facility production employees (Proceedings of the Navy Quality Circle Meeting). Washington, DC: Naval Material Command, 1982.

Hulin, C. L., & Blood, M. R. Job enlargement, individual differences, and worker responses. Psychological Bulletin, 1968, 69, 41-65.

Jenkins, G. P., Nadler, D. A., Lawler, E. E., & Cammann, C. Standardized observations: An approach to measuring the nature of jobs. Journal of Applied Psychology, 1975, 60, 171-180.

Jick, T. Mixing qualitative and quantitative methods: Triangulation in action. Administrative Science Quarterly, 1979, 24(4), 602-611.

Juran, J. M. International significance of the quality circle movement. Reports of Statistical Application Research, Tokyo: 1978, 25(3).

Klein, C. D. Implementing quality circles: A hard look at some of the realities. Personnel, 1981, 58(6), 11-20.

Lau, A. W. Personal and organizational determinants of enlisted attrition (NPRDC Tech. Rep. 79-11). San Diego: Navy Personnel Research and Development Center, March 1979. (AD-A065 386)

Law, J. M. Quality control circles at the Norfolk Naval Shipyard. Management, 1980, 1(4), 2-5.

Lawler, E. E., & Hall, D. T. Relationship of job characteristics to job involvement, satisfaction, and intrinsic motivation. Journal of Applied Psychology, 1970, 54, 305-312.

Locke, E., & Schweiger, D. Partners in decision making: One more look. In B. Shaw (Ed.), Research in Organizational Behavior (Vol. 1). Greenwich: JAI Press, 1979.

Lodahl, T. M., & Kejner, M. The definition and measurement of job involvement. Journal of Applied Psychology, 1965, 49, 24-33.

Lorsch, J., & Lawrence, P. The diagnosis of organizational problems. In W. G. Bennis, K. Benne, & R. Chin (Eds.), Dynamics of Planned Change. New York: Holt, Rinehart, and Winston, 1968.

Lowin, A. Participative decision making: A model, literature critique, and prescriptions for research. Organizational Behavior and Human Performance, 1968, 3, 68-106.

Metz, E. Caution: Quality circles ahead. Training and Development Journal, 1981, 35(8), 71-76. (a)

Metz, E. Diagnostic readiness. The Quality Circle Journal, 1981, 4(4), 16-21. (b)

Moos, R. H. The human context. New York: John Wiley & Sons, 1976.

Mowday, R. T., Steers, R. M., & Porter, L. W. The measurement of organizational commitment: A progress report (TR 78-15). Oregon: University of Oregon, Graduate School of Management, July 1978.

Novelli, L. & Mohrman, S. A. A little bit of participation can be a dangerous thing. Meeting of the Western Academy of Management, Colorado Springs, CO, 1982.

Patchen, M. Some questionnaire measures of employee motivation and morale. Ann Arbor, MI: Survey Research Center, University of Michigan, 1965.

Patchen, R. I. Quality circles--a viable alternative for productivity improvement. Los Angeles: Northrop Corporation, Aircraft Group: Author, 1980.

Penn, R., Sheposh, J. P., Riedel, J. A., & Young, L. E. Job and organization characteristics as they pertain to job satisfaction and work motivation. In K. D. Duncan, M. M. Grunebert, and D. Wallis (Eds.), Changes in Working Life. New York: John Wiley & Sons, 1980.

Pritchard, R. D., & Karasick, B. W. The effects of organizational climate on managerial performance and job satisfaction. Organizational Behavior and Human Performance, 1973, 9, 126-146.

Rabinowitz, S., & Hall, D. T. Organizational research on job involvement, Psychological Bulletin, 1977, 84(2), 265-288.

Rich, B. L., Ryland, C. W., & Ruggerio, D. W. Japanese management techniques: Can they help improve productivity in the U.S. public sector? Washington, DC: The Industrial College of the Armed Forces, May 1982.

Rizzo, J. R., House, R. J., & Lirtzman, S. I. Role conflict and ambiguity in complex organizations. Administrative Science Quarterly, 1970, 15, 150-163.

Steel, R. P., Lloyd, R. F., Ovalle, N. K., & Hendrix, W. H. Designing quality circle research. The Quality Circles Journal, 1982, 6, 41-43.

Strauss, G. Workers' attitudes and adjustments. In J. W. Rosow (Ed.), The worker and the job. Englewood Cliffs, NJ: Prentice-Hall, 1974.

Yager, E. C. The quality control circle explosion. Training and Development Journal, 1981, 35(4), 98-105.

Young, L. E., Riedel, J. A., & Sheposh, J. P. Relationship between perceptions of role stress and individual, organizational and environmental variables (NPRDC Tech. Rep. 80-8). San Diego: Navy Personnel Research and Development Center, December 1979. (AD-A079 541)

APPENDIX A

QC EXPECTATION QUESTIONNAIRE

QUALITY CIRCLE QUESTIONNAIRE

Welcome to the Quality Circle Program. You will be meeting with other people from your code to discuss problems that all of you would like to solve. Your code and this organization will benefit from the contributions that are made.

Periodically, you will be asked to complete a questionnaire which focuses on attitudes that you have toward your work. These questionnaires were developed by researchers at the Navy Personnel Research and Development Center, San Diego, who are interested in the impact that Quality Circles may have on work-related activities. The first questionnaire is enclosed on the following pages. Please complete it and return it as instructed by your leader. Before you begin, please print your name, activity, code, SSN, and today's date in the space provided below. (Your name and SSN will be given a number, and this sheet will be detached from your responses in order to assure anonymity.) Your cooperation is appreciated.

(Please print)

_____

Last Name First Name Activity Code

Your Social Security Number _____

Today's Date _____

PRIVACY ACT STATEMENT

Under the authority of 57USC302, as reflected in OPNAV Notice 5450 of 17 April 1975, information is requested regarding your personal opinions and attitudes. The information will be used for statistical purposes only. In no case will an individual's response be used in making decisions affecting that person. You are not required to provide this information; your participation is voluntary.

QUALITY CIRCLE QUESTIONNAIRE

PLEASE CHECK THE APPROPRIATE BOX

A. 1. ☐ Supervisory

2. ☐ Nonsupervisory

B. Pay Category

1. ☐ WG

2. ☐ WL

3. ☐ WS

4. ☐ GS

5. ☐ Military

C. Pay Grade

1. ☐ 1-4

2. ☐ 5-8

3. ☐ 9-11

4. ☐ 12-13

5. ☐ 14 or above

D. Sex

1. ☐ Male

2. ☐ Female

E. Age Bracket

1. ☐ Less than 20 years of age

2. ☐ 21-30 years

3. ☐ 31-40 years

4. ☐ 41-50 years

5. ☐ 51-60 years

6. ☐ 61-70 years

F. Education

1. ☐ Some Elementary School (Grades 1-7)

2. ☐ Completed Elementary School (8 grades)

3. ☐ Some High School (9-11 years)

4. ☐ Graduated from High School

5. ☐ Some college or technical training beyond high school (1-3 years)

6. ☐ Graduated from college (BA, BS, or other bachelor's degree)

7. ☐ Graduate degree (M.A. or other)

G. How long have you worked in this department or division?

1. ☐ less than 6 months
2. ☐ 6 months to 2 years
3. ☐ 2-4 years
4. ☐ 4 1/2 years to 8 years
5. ☐ 8 1/2 years to 12 years
6. ☐ greater than 12 years

H. How long have you worked at this activity or organization?

1. ☐ less than 6 months
2. ☐ 6 months to 2 years
3. ☐ 2 1/2 years - 4 years
4. ☐ 4 1/2 years - 8 years
5. ☐ 8 1/2 years - 12 years
6. ☐ greater than 12 years

I. What are the most important reasons you volunteered to participate in Quality Circles? CHECK all the reasons that you feel are most important and add any other reasons not listed.

1. ☐ I wanted a chance to solve work problems
2. ☐ I wanted to find out what Quality Circles were all about
3. ☐ I thought volunteering might lead to a promotion or a pay raise
4. ☐ I had heard things about Quality Circles
5. ☐ I wanted to have an hour off my regular work
6. ☐ I thought it would look good on my record
7. ☐ I wanted to get the training in problem solving techniques
8. ☐ I wanted my supervisor to recognize my initiative
9. ☐ Everyone else in my workgroup was volunteering
10. ☐ I wanted to have a chance to express my ideas
11. ☐ I felt my supervisor wanted me to volunteer
12. ☐ I thought Quality Circles might solve some problems and make my job easier
13. ☐ I wanted a chance to be recognized by management
14. _____
_____
15. _____
_____
16. _____
_____

J. What do you expect might be the obstacles to Quality Circles' success? CHECK all the obstacles that are expected and add any others not listed.

1. ☐ employees losing interest
2. ☐ management not implementing circle ideas
3. ☐ leaders losing interest
4. ☐ supervisors not letting members go to Circle meetings
5. ☐ loss of management's support
6. ☐ no signs of improvement to convince management to keep Circles
7. _____
   _____
8. _____
   _____
9. _____
   _____

K. What do you expect will be the most likely positive outcomes of Quality Circles for the organization? CHECK all that you feel are most likely and add any not listed.

1. ☐ problems solved
2. ☐ better quality work
3. ☐ greater productivity
4. ☐ employees listened to by management
5. ☐ better communication within my department
6. ☐ more positive attitudes about work
7. ☐ better relations with supervisors
8. ☐ more communication within the organization
9. ☐ my job will be easier
10. ☐ supervisors' leadership skills will improve
11. ☐ employees will be trained to solve problems
12. ☐ better relationships with other workers
13. ☐ better relationship with union
14. ☐ improved morale among employees
15. ☐ more highly motivated employees
16. ☐ reduced absenteeism
17. _____
    _____
18. _____
    _____
19. _____
    _____

THANK YOU FOR YOUR COOPERATION!

L. How satisfied are you with the following aspects of your job?

Check the appropriate number to indicate your satisfaction with each item.	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
1. The persons in your workgroup	1. ___	2. ___	3. ___	4. ___	5. ___
2. Your supervisor	1. ___	2. ___	3. ___	4. ___	5. ___
3. Your job in general	1. ___	2. ___	3. ___	4. ___	5. ___
4. The progress you have made in this organization up to now	1. ___	2. ___	3. ___	4. ___	5. ___
5. The respect you get from people you work with	1. ___	2. ___	3. ___	4. ___	5. ___
6. Your job security	1. ___	2. ___	3. ___	4. ___	5. ___
7. The pay you receive for the job you do	1. ___	2. ___	3. ___	4. ___	5. ___
8. The opportunities you have to develop your skills and abilities	1. ___	2. ___	3. ___	4. ___	5. ___

	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
9. Your working conditions	1. ____	2. ____	3. ____	4. ____	5. ____
10. The communication you have with your supervisor	1. ____	2. ____	3. ____	4. ____	5. ____
11. Seeing the results of your work	1. ____	2. ____	3. ____	4. ____	5. ____
12. The recognition you get for doing a good job	1. ____	2. ____	3. ____	4. ____	5. ____
13. The chances you have to see a job through to completion	1. ____	2. ____	3. ____	4. ____	5. ____

APPENDIX B

PRE- AND POST-QC ATTITUDE QUESTIONNAIRE

WORK ATTITUDES

The Navy Personnel Research and Development Center is studying a number of Navy organizations to see how people feel about different aspects of their jobs. We would appreciate it very much if you would take the time to answer each question honestly. All responses will be kept anonymous and confidential. We ask for your name and Social Security Number (SSN) in order to match responses to this questionnaire with responses to the questionnaire you completed last year.

Your name and SSN are requested on this cover page and will be detached from your responses. No one at your organization will be allowed to see any responses. We hope our efforts here will result in improvements at this organization, and we thank you for your cooperation.

Sincerely,

L. Atwater

S. Sander

L. Atwater
S. Sander
Personnel Researchers

Your Name _____
Please Print

Your SSN _____

Today's Date _____

Activity _____

Code _____

PRIVACY ACT STATEMENT

Under the authority of 57USC302, as reflected in OPNAV Notice 5450 of 17 April 1975, information is requested regarding your personal opinions and attitudes. The information will be used for statistical purposes only. In no case will an individual's response be used in making decisions affecting that person. You are not required to provide this information; your participation is voluntary.

This booklet contains a number of questions about different aspects of your job. Please answer each question honestly by circling the number next to the best answer. All responses will be anonymous.
Please do not skip any items.
Circle only one response per item and mark it clearly as shown below.

Example Question

To what extent do you enjoy your hobbies?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

By circling the (2) you have indicted that you enjoy your hobbies to a large extent. Please answer the questions that follow in a similar manner.

SECTION A

(SU) A. 1. Supervisory
2. Nonsupervisory

B. Pay Category

1. WG
2. WL
(GS) 3. WS
4. GS
5. Military

C. Pay Grade

1. 1-4
2. 5-8
(GD) 3. 9-11
4. 12-13
5. 14 or above

D. Sex

(SX) 1. Male
2. Female

E. Age Bracket

1. Less than 20 years
2. 21-30 years
(AG) 3. 31-40 years
4. 41-50 years
5. 51-60 years
6. 61-70 years

F. Education

1. Some elementary school (grades 1-7)
2. Completed elementary school (8 grades)
3. Some high school (grades 9-11)
(ED) 4. Graduated from high school
5. Some college or technical training beyond high school
6. Graduated from a two-year college
7. Graduated from college with bachelor's degree
8. Graduate degree (MA or other)

G. How long have you worked in your present department or division?

1. less than 6 months
2. 6 months to 2 years
(TC) 3. 2 to 4 years
4. 4 1/2 years to 8 years
5. 8 1/2 years to 12 years
6. more than 12 years

H. How long have you worked at this activity or organization?

1. less than 6 months
2. 6 months to 2 years
(TA) 3. 2 1/2 years to 4 years
4. 4 1/2 years to 8 years
5. 8 1/2 years to 12 years
6. more than 12 years

SECTION 1

The following questions refer to <u>your immediate work group</u>. Please answer each question by <u>circling the number</u> next to the best answer.

1. To what extent does your job require a lot of cooperative work with other people?

(A1)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

2. To what extent is your job one where a lot of other people can be affected by how well the work gets done?

(A2)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

3. To what extent does your job give you a chance to use your personal initiative or judgment in carrying out the work?

(A3)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

4. To what extent is your job itself significant and important in the broader scheme of things?

(A4)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

5. To what extent are you hindered from doing a good job by inadequate equipment, supplies, or support?

(A5)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

6. To what extent do workers participate in making important decisions related to their work?

(A6)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

7. To what extent does your job require you to handle surprising or unpredictable situations?

(A7)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

8. To what extent does performing your job give you a feeling of <u>accomplishment</u>?

(A8)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

9. To what extent do those in charge give you "feedback" about how well you are doing your work?

(A9)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

10. To what extent does your job require you to use a number of complex or high-level skills?

(AA)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

SECTION 2

		Rate your work center in terms of how well it does in the following areas by circling the number under the best answer	Very good	Good	Fair	Poor	Very poor	Does not apply
(B1)	11.	Productivity--amount of work accomplished for money and time spent.	1	2	3	4	5	6
(B2)	12.	Responsiveness--ability to start and complete work quickly.	1	2	3	4	5	6
(B3)	13.	Adaptability--ability to meet changing conditions and demands.	1	2	3	4	5	6
(B4)	14.	Customer or consumer satisfaction--extent to which consumers are satisfied with your workgroup's performance.	1	2	3	4	5	6
(B5)	15.	Quality--the quality of work performed by your workgroup.	1	2	3	4	5	6

SECTION 3

The following questions are about your IMMEDIATE supervisor. Please answer each question by circling the number next to the best answer.

16. To what extent does your supervisor encourage you to participate in important decisions?

(C1)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

17. To what extent does your supervisor stand up for you or support you?

(C2)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

18. To what extent does your supervisor see to it that you know what has to be done?

(C3)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

19. To what extent does your supervisor help you solve work-related problems?

(C4)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

20. To what extent does your supervisor expect you to do high quality work?

(C5)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

21. To what extent does your supervisor do a good job of judging your performance?

(C6)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

22. How well does your supervisor know the technical parts of his or her job?

1. Knows them very well
2. Knows them quite well
(C7) 3. Knows them somewhat
4. Knows a little
5. Knows nothing

23. How well does your supervisor know the administrative parts of his or her job?

1. Knows them very well
2. Knows them quite well
(C8) 3. Knows them somewhat
4. Knows a little
5. Knows nothing

24. To what extent does your supervisor help you develop your skills?

1. To a very great extent
2. To a large extent
(C9) 3. To some extent
4. To a small extent
5. Not at all

25. To what extent does your supervisor praise good work?

1. To a very great extent
2. To a large extent
(CA) 3. To some extent
4. To a small extent
5. Not at all

26. How often does your immediate supervisor check to see how you are doing on your job?

1. Very often
2. Often
(CB) 3. Occasionally
4. Seldom
5. Almost never

27. How much does your supervisor know about your on-the-job performance?

1. Knows a lot
2. Knows quite a bit
(CC) 3. Knows something
4. Knows a little
5. Knows nothing

28. To what extent does your supervisor keep poor performers from getting rewarded?

1. To a very great extent
2. To a large extent
(CD) 3. To some extent
4. To a small extent
5. Not at all

29. To what extent does your supervisor see to it that good performers are rewarded?

1. To a very great extent
2. To a large extent
(CE) 3. To some extent
4. To a small extent
5. Not at all

SECTION 4

Please indicate how much you agree with each item by circling the number next to the best answer.

30. The most important things that happen to me involve my work.

1. Strongly agree
2. Agree
(D1) 3. Disagree
4. Strongly disagree

31. The major satisfaction in my life comes from my job.

1. Strongly agree
2. Agree
(D2) 3. Disagree
4. Strongly disagree

32. I'm really a perfectionist about my work.

1. Strongly agree
2. Agree
(D3) 3. Disagree
4. Strongly disagree

33. I am very much involved personally in my work.

1. Strongly agree
2. Agree
(D4) 3. Disagree
4. Strongly disagree

34. Most things in life are more important than work.

1. Strongly agree
2. Agree
(D5) 3. Disagree
4. Strongly disagree

35. I usually show up for work a little early to get things ready.

1. Strongly agree
2. Agree
(D6) 3. Disagree
4. Strongly disagree

36. I avoid taking on extra duties and responsibilities in my work.

1. Strongly agree
2. Agree
(D7) 3. Disagree
4. Strongly disagree

37. I used to care more about my work but now other things are more important to me.

1. Strongly agree
2. Agree
(D8) 3. Disagree
4. Strongly disagree

38. I used to be more ambitious about my work than I am now.

1. Strongly agree
2. Agree
(D9) 3. Disagree
4. Strongly disagree

SECTION 5

Please answer the following questions by circling the number next to the best answer.

39. When I do my work well it gives me a feeling of accomplishment.

1. Strongly agree
2. Agree
(E1) 3. Disagree
4. Strongly disagree

40. When I perform my job well it contributes to my personal growth and development.

1. Strongly agree
2. Agree
(E2) 3. Disagree
4. Strongly disagree

41. I feel a great sense of personal satisfaction when I do my job well.

1. Strongly agree
2. Agree
(E3) 3. Disagree
4. Strongly disagree (E7)

42. Doing my job well increases my feelings of self esteem.

1. Strongly agree
2. Agree
(E4) 3. Disagree
4. Strongly disagree

43. On most days on your job, how often does <u>time</u> seem to <u>drag</u> for you? (E8)

1. About half the day or more
2. About one-third of the day
(E5) 3. About one-quarter of the day
4. About one-eighth of the day
5. Time never seems to drag

44. Some people are completely involved in their job--they are absorbed in it night and day. For other people, their job is simply one of several interests. How involved do you feel in your job? (E9)

1. Very little involved; my other interests are more important
2. Slightly involved
(E6) 3. Moderately involved; my job and my other interests are equally important to me (EA)
4. Strongly involved
5. Very strongly involved; my work is the most important interest in my life

(EB)

45. How often do you do some extra work for your job which isn't really required of you?

1. About once a month or less
2. Once every few weeks
3. About once a week
4. Several times a week
5. Almost every day

46. Would you say you work harder, less hard, or about the same as other people doing your type of work in your organization?

1. Much less hard than most others
2. A little less hard than most others
3. About the same as most others
4. A little harder than most others
5. Much harder than most others

47. To what extent are you satisfied with this job?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

48. To what extent do you feel a very high degree of <u>personal</u> responsibility for the work you do on this job?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

49. To what extent do you personally care how well the job gets done?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

SECTION 6

The following questions are about communication. Please answer the following questions by circling the number corresponding to the best answer.

50. In general how do you feel about the kind of communication you receive from your immediate supervisor? Is it...

(F1)
1. More than adequate
2. Quite adequate
3. Fairly adequate
4. Quite inadequate
5. Very inadequate

51. On the whole what is the average amount of time per week you spend talking with your immediate supervisor at work?

(F2)
1. Less than 15 minutes per week.
2. Between 15 and 30 minutes per week.
3. Between 30 minutes and 1 hour per week.
4. Between 1 and 3 hours per week.
5. More than 3 hours per week.

How often do you and your immediate supervisor usually talk about each of the following things?

		Never	Once a month or less	About once a week	Two or three times a week	Once a day or more often
(F3)	52. About problems at work	1	2	3	4	5
(F4)	53. About ways work could be improved	1	2	3	4	5
(F5)	54. About ways supervision could be improved	1	2	3	4	5
(F6)	55. About work in general	1	2	3	4	5
(F7)	56. About employee wages, hours or benefits	1	2	3	4	5
(F8)	57. About your performance	1	2	3	4	5
(F9)	58. About ways working relations or morale could be improved	1	2	3	4	5
(FA)	59. About things outside of work	1	2	3	4	5

How often does your immediate supervisor do the following?

		Always	Most of the time	Some-times	Seldom	Never
(FB)	60. Show appreciation for your work	1	2	3	4	5
(FC)	61. Show confidence in you	1	2	3	4	5
(FD)	62. Give you directions or orders	1	2	3	4	5
(FE)	63. Explain things or give information	1	2	3	4	5
(FF)	64. Ask you for information	1	2	3	4	5
(FG)	65. Criticize you	1	2	3	4	5
(FH)	66. Give unnecessary information or comments	1	2	3	4	5

67. When people work together they talk about work, personal interests and other things. Think of the person in your workgroup that you talk with the most. Indicate the average amount of time per week you talk with this person while at work. (FM)

1. I usually talk with this person less than 1/2 hour per week
2. Between 1/2 and 2 hours per week
3. Between 2 and 4 hours per week
4. Between 4 and 6 hours per week
5. More than 6 hours per week

(FI)

68. This person (with whom you talk most frequently) has what position? (FN)

1. This person has a position lower than mine
2. This person has a position at about the same level as mine
3. This person is my immediate supervisor
4. This person has a position higher than mine (but is not my immediate supervisor)

(FJ)

69. About how many people outside your workgroup do you talk with in an average week in the process of doing your job? (FP)

1. 0
2. 1-4 persons
3. 5-10 persons
4. 11-20 persons
5. more than 20 persons

(FK)

70. About how many people must you interact with weekly outside your workgroup in order to get things done on your job? (FQ)

1. 0
2. 1-4 persons
3. 5-10 persons
4. 11-20 persons
5. more than 20 persons

(FL)

71. How would you characterize most of your work-related interactions with people outside your workgroup?

1. Very warm and friendly
2. Friendly
3. Neutral
4. Unfriendly
5. Almost hostile

72. In general how well would you say members of your workgroup communicate about what's going on at work? (FN)

1. Extremely well
2. Quite well
3. Fairly well
4. Poorly
5. Very poorly

73. In general, how well would you say top management communicates with employees? (FO)

1. Extremely well
2. Quite well
3. Fairly well
4. Poorly
5. Very poorly

74. In general, how well informed would you say top management is about what really goes on in your work center? (FP)

1. Extremely well
2. Quite well
3. Fairly well
4. Poorly
5. Very poorly

75. In general, how well does top management respond to ideas from below? (FQ)

1. Extremely well
2. Quite well
3. Fairly well
4. Poorly
5. Very poorly

For the following questions indicate the extent to which you agree with each statement by circling the number next to the best answer.

76. There have been avenues available in the last year for communicating with the heads of your department.

1. Strongly agree
2. Agree
(FR) 3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

77. Positive changes have been made in this organization as a result of ideas presented to managers by the workforce.

1. Strongly agree
2. Agree
(FS) 3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

78. There have been negative effects on this organization from management failing to listen to those below them.

1. Strongly agree
2. Agree
(FT) 3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

SECTION 7

The following questions are about your workgroup. Please circle the number next to the best answer to each.

79. To what extent does your workgroup plan together and coordinate its efforts?

1. To a very great extent
2. To a large extent
(G1) 3. To some extent
4. To a small extent
5. Not at all

80. To what extent does your workgroup make good decisions and solve problems well?

1. To a very great extent
2. To a large extent
(G2) 3. To some extent
4. To a small extent
5. Not at all

81. To what extent is information about important events and situations shared within your workgroup?

1. To a very great extent
2. To a large extent
(G3) 3. To some extent
4. To a small extent
5. Not at all

82. To what extent do persons in your workgroup know what their jobs are and how to do them well?

1. To a very great extent
2. To a large extent
(G4) 3. To some extent
4. To a small extent
5. Not at all

83. To what extent do you have confidence and trust in the persons in your workgroup?

1. To a very great extent
2. To a large extent
(G5) 3. To some extent
4. To a small extent
5. Not at all

84. To what extent is your workgroup able to respond to unusual work demands placed upon it?

1. To a very great extent
2. To a large extent
(G6) 3. To some extent
4. To a small extent
5. Not at all

85. To what extent does your workgroup really want to meet its objectives?

1. To a very great extent
2. To a large extent
(G7) 3. To some extent
4. To a small extent
5. Not at all

86. To what extent is there a feeling of group pride among members of your workgroup?

1. To a very great extent
2. To a large extent
(G8) 3. To some extent
4. To a small extent
5. Not at all

SECTION 8

The following questions are about your job. Please circle the number next to the best answer.

87. To what extent do you know what your responsibilities are?

1. To a very great extent
2. To a large extent
(H1) 3. To some extent
4. To a small extent
5. Not at all

88. To what extent do you feel certain about how you will be evaluated for a raise or promotion?

1. To a very great extent
2. To a large extent
(H2) 3. To some extent
4. To a small extent
5. Not at all

89. To what extent do you know exactly what is expected of you?

1. To a very great extent
2. To a large extent
(H3) 3. To some extent
4. To a small extent
5. Not at all

90. To what extent do you know that you have divided your time properly?

1. To a very great extent
2. To a large extent
(H4) 3. To some extent
4. To a small extent
5. Not at all

91. To what extent are explanations clear about what has to be done?

1. To a very great extent
2. To a large extent
(H5) 3. To some extent
4. To a small extent
5. Not at all

92. To what extent are you given enough time to do what is expected of you on the job?

1. To a very great extent
2. To a large extent
(H6) 3. To some extent
4. To a small extent
5. Not at all

93. To what extent does it seem like you have too much work for one person to do?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(H7)

94. To what extent are the performance standards on your job too high?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(H8)

95. To what extent do you do things that are likely to be accepted by one person and not accepted by others?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(H9)

96. To what extent do you know if your work will be acceptable to your boss?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HA)

97. To what extent is it difficult to satisfy everybody at the same time?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HB)

98. To what extent do you have to break rules to get everything done on your job?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HC)

99. To what extent do people ask you to do things on your job which get in the way of your work?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HD)

100. To what extent do you feel certain about how much authority you have?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HE)

101. To what extent do you work under conflicting policies and guidelines?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HF)

102. To what extent does your workgroup receive job assignments without enough manpower to complete them?

1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

(HG)

SECTION 9

The next two questions are about working conditions. Please circle the number next to the best answer to each.

103. How would you evaluate your working conditions, in terms of comfort (e.g., space, lighting, temperature)?

(I1)
1. Very good
2. Good
3. Adequate
4. Poor
5. Very poor

104. How would you evaluate your working conditions in terms of safety?

(I2)
1. Very safe
2. Quite safe
3. Somewhat safe/somewhat unsafe
4. Quite unsafe
5. Very unsafe

SECTION 10

The following questions ask you about the organization. Please answer each question by circling the number next to the best answer.

105. How much freedom do you have in making day-to-day decisions on the job?

(J1)
1. A great deal
2. Quite a bit
3. Some
4. A little
5. None

106. To what extent do members of your workgroup cooperate to get the work done?

(J2)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

107. To what extent do outside departments that you depend on cooperate with your department in getting the work done?

(J3)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

108. How well defined are methods and procedures for accomplishing your work?

(J4)
1. Very well defined
2. Quite well defined
3. Somewhat defined
4. Not very well defined
5. Not at all well defined

109. To what extent are you required to keep explicit records and write everything down?

(J5)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

110. To what extent do you feel the organization (top management) is interested in the welfare of employees?

(J6)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

111. To what extent do you feel top managers are willing to support you and your fellow workers in job related matters?

(J7)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

112. How likely is it that a person who does a poor job will be reprimanded?

(J8)
1. Extremely likely
2. Likely
3. Somewhat likely
4. Unlikely
5. Extremely unlikely

113. In this organization to what extent are threats and punishments used as a way to get people to do better work?

(J9)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

114. How likely is it that a person who does a good job will be rewarded?

(JA)
1. Extremely likely
2. Likely
3. Somewhat likely
4. Unlikely
5. Extremely unlikely

115. Your pay is fair in comparison to what others in similar jobs in this organization are paid.

(JB)
1. Strongly agree
2. Agree
3. Not sure
4. Disagree
5. Strongly disagree

116. Your pay is fair considering what people in similar jobs in private industry are making.

(JC)
1. Strongly agree
2. Agree
3. Not sure
4. Disagree
5. Strongly disagree

117. The fringe benefits working at this organization are better than one would get in private industry.

(JD)
1. Strongly agree
2. Agree
3. Not sure
4. Disagree
5. Strongly disagree

SECTION 11

Please circle the number next to the best answer to each of the following questions.

118. To what extent do you feel you owe it to your fellow workers to do a good job?

(K1)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

119. To what extent do you feel there is open, honest communication between members of your workgroup?

(K2)
1. To a very great extent
2. To a large extent
3. To some extent
4. To a small extent
5. Not at all

120. To what extent do you feel personally concerned about the welfare of the other members of your workgroup?

1. To a very great extent
2. To a large extent
(K3) 3. To some extent
4. To a small extent
5. Not at all

121. To what extent do you feel members of your workgroup would be concerned and willing to help if you had a problem?

1. To a very great extent
2. To a large extent
(K4) 3. To some extent
4. To a small extent
5. Not at all

122. To what extent do you feel sociable toward people from your workgroup?

1. To a very great extent
2. To a large extent
(K5) 3. To some extent
4. To a small extent
5. Not at all

123. To what extent do you feel like you have some control of the way work gets done in your area?

1. To a very great extent
2. To a large extent
(K6) 3. To some extent
4. To a small extent
5. Not at all

124. To what extent do you feel you have input into decisions that affect your work?

1. To a very great extent
2. To a large extent
(K7) 3. To some extent
4. To a small extent
5. Not at all

125. How would you define the atmosphere of this organization?

1. Very friendly and warm
2. Friendly
(K8) 3. Neutral
4. Unfriendly
5. Very unfriendly and cold

126. How flexible would you say this organization is when it comes to trying new things?

1. Very flexible
2. Rather flexible
(K9) 3. Neither flexible nor inflexible
4. Rather inflexible
5. Very rigid or inflexible

127. How flexible would you say this organization is when it comes to dealing with crisis situations?

1. Very flexible
2. Rather flexible
(KA) 3. Neither flexible nor inflexible
4. Rather inflexible
5. Very rigid or inflexible

SECTION 12

The following questions apply to your work group--you and all others who report to your supervisor. Each question asks you how it is now and how you'd <u>like</u> it to be. <u>Circle the number</u> corresponding to the best answer for each.

128. To what extent are the persons in your workgroup friendly and easy to approach? This is how it is <u>now</u>

1. To a very great extent
2. To a large extent
(L1) 3. To some extent
4. To a small extent
5. Not at all

129. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(L2) 3. To some extent
4. To a small extent
5. Not at all

130. When you talk to persons in your workgroup, to what extent do they pay attention to what you are saying? This is how it is now

1. To a very great extent
2. To a large extent
(L3) 3. To some extent
4. To a small extent
5. Not at all

131. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(L4) 3. To some extent
4. To a small extent
5. Not at all

132. To what extent are persons in your workgroup willing to listen to your work-related problems? This is how it is now

1. To a very great extent
2. To a large extent
(L5) 3. To some extent
4. To a small extent
5. Not at all

133. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(L6) 3. To some extent
4. To a small extent
5. Not at all

134. To what extent do persons in your workgroup encourage each other to work as a team? This is how it is now

1. To a very great extent
2. To a large extent
(L7) 3. To some extent
4. To a small extent
5. Not at all

135. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(L8) 3. To some extent
4. To a small extent
5. Not at all

136. To what extent do persons in your workgroup emphasize a team goal? This is how it is now

1. To a very great extent
2. To a large extent
(L9) 3. To some extent
4. To a small extent
5. Not at all

137. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LA) 3. To some extent
4. To a small extent
5. Not at all

138. To what extent do persons in your workgroup exchange opinions and ideas? This is how it is now

1. To a very great extent
2. To a large extent
(LB) 3. To some extent
4. To a small extent
5. Not at all

139. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LC) 3. To some extent
4. To a small extent
5. Not at all

140. To what extent do persons in your workgroup encourage each other to give their best efforts? This is how it is now

1. To a very great extent
2. To a large extent
(LD) 3. To some extent
4. To a small extent
5. Not at all

141. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LE) 3. To some extent
4. To a small extent
5. Not at all

142. To what extent do persons in your workgroup maintain high standards of performance? This is how it is now

1. To a very great extent
2. To a large extent
(LF) 3. To some extent
4. To a small extent
5. Not at all

143. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LG) 3. To some extent
4. To a small extent
5. Not at all

144. To what extent do persons in your workgroup help you find ways to do a better job? This is how it is now

1. To a very great extent
2. To a large extent
(LH) 3. To some extent
4. To a small extent
5. Not at all

145. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LI) 3. To some extent
4. To a small extent
5. Not at all

146. To what extent do persons in your workgroup provide information or help so that you can plan work ahead of time? This is how it is now

1. To a very great extent
2. To a large extent
(LJ) 3. To some extent
4. To a small extent
5. Not at all

147. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LK) 3. To some extent
4. To a small extent
5. Not at all

148. To what extent do persons in your workgroup offer each other new ideas for solving job-related problems? This is how it is now

1. To a very great extent
2. To a large extent
(LL) 3. To some extent
4. To a small extent
5. Not at all

149. This is how I'd like it to be

1. To a very great extent
2. To a large extent
(LM) 3. To some extent
4. To a small extent
5. Not at all

SECTION 13

CIRCLE the appropriate number to indicate your satisfaction with each item.

How satisfied are you with the following aspects of your job?

			Very Satisfied	Satisfied	Neither Satisfied nor Dissatisfied	Dissatisfied	Very Dissatisfied
(M1)	150.	The persons in your workgroup	1	2	3	4	5
(M2)	151.	Your supervisor	1	2	3	4	5
(M3)	152.	Your job in general	1	2	3	4	5
(M4)	153.	The progress you have made in this organization up to now	1	2	3	4	5
(M5)	154.	The respect you get from people you work with	1	2	3	4	5
(M6)	155.	Your job security	1	2	3	4	5
(M7)	156.	The pay you receive for the job you do	1	2	3	4	5
(M8)	157.	The opportunities you have to develop your skills and abilities	1	2	3	4	5
(M9)	158.	Your working conditions	1	2	3	4	5
(MA)	159.	The communication you have with your supervisor	1	2	3	4	5
(MB)	160.	Seeing the results of your work	1	2	3	4	5
(MC)	161.	The recognition you get for doing a good job	1	2	3	4	5
(MD)	162.	The chances you have to see a job through to completion	1	2	3	4	5

SECTION 14

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working please indicate the degree of your agreement or disagreement with each statement by circling the number next to the best answer.

163. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.

(N1)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

164. I talk up this organization to my friends as a great organization to work for.

(N2)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

165. I feel very little loyalty to this organization.

(N3)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

166. I would accept almost any type of job assignment in order to keep working for this organization.

(N4)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

167. I find that my values and the organization's values are very similar.

(N5)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

168. I am proud to tell others that I am part of this organization.

(N6)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

169. I could just as well be working for a different organization as long as the type of work were similar.

(N7)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

170. This organization really inspires the very best in me in the way of job performance.

(N8)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

171. It would take very little change in my present circumstances to cause me to leave this organization.

(N9)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

172. I am extremely glad that I chose this organization to work for, over others I was considering at the time I joined.

(NA)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

173. There's not too much to be gained by sticking with this organization indefinitely.

(NB)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

174. Often, I find it difficult to agree with this organization's policies on important matters relating to its employees.

(NC)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

175. I really care about the fate of this organization.

(ND)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

176. For me this is the best of all possible organizations for which to work.

(NE)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

177. Deciding to work for this organization was a definite mistake on my part.

(NF)
1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

178. About how many hours of your work week is spent in meetings?

(NG)
1. 0-1 hour per week
2. 2-4 hours per week
3. 5-10 hours per week
4. 11-15 hours per week
5. more than 15 hours per week

Many people at your organization completed a questionnaire similar to this one about a year ago. If you filled out one of those questionnaires, please answer the following questions:

179. Are you still part of the same work group?

(Z1)
1. Yes
2. No

180. Do you have the same supervisor that you had when you completed the last questionnaire?

(Z2)
1. Yes
2. No

181. How many of the people you now work with are the same ones you worked with when you filled out the last questionnaire?

(Z3)
1. All
2. Most
3. Some
4. Few
5. None

Please read the following description of a Quality Circle and answer the question.

182. (Z4) A Quality Circle is a small group of workers from the same work area. They meet for one hour each week on company time to identify and solve work-related problems. The group's supervisor is usually a member. After a problem is solved, the members present to management a summary of the work they completed in solving a problem and the solution they propose. If your organization started Quality Circles, would you consider becoming a member?

1. Definitely
2. Probably
3. Probably not
4. Definitely not
5. Don't know

THANK YOU FOR YOUR COOPERATION!

DISTRIBUTION LIST

Chief of Naval Operations (OP-115) (2), (OP-135C4), (OP-14), (OP-140F2), (OP-987H)
Chief of Naval Material (NMAT 0722)
Chief of Naval Research (Code 270), (Code 440), (Code 442), (Code 442PT)
Chief of Naval Education and Training (00A), (N-21)
Chief of Naval Technical Training (N-6)
Commandant of the Marine Corps (MPI-20)
Commander Naval Military Personnel Command (NMPC-013C)
Commander Navy Recruiting Command
Commanding Officer, Naval Aerospace Medical Institute (Library Code 12) (2)
Commanding Officer, Naval Training Equipment Center (Technical Library) (5), (Code N-1)
Commanding Officer, Office of Naval Research Branch Office, Chicago (Coordinator for Psychological Sciences)
Superintendent, Naval Postgraduate School
Commander, Army Research Institute for the Behavioral and Social Sciences, Alexandria (PERI-ASL), (PERI-ZT), (PERI-SZ)
Commander, Air Force Human Resources Laboratory, Brooks Air Force Base (Manpower and Personnel Division), (Scientific and Technical Information Office)
Commander, Air Force Human Resources Laboratory, Williams Air Force Base (AFHRL/OT)
Commander, Air Force Human Resources Laboratory, Wright-Patterson Air Force Base (AFHRL/LR)
Commanding Officer, U.S. Coast Guard Research and Development Center, Avery Point
Institute for Defense Analyses, Science and Technology Division
Defense Technical Information Center (DDA) (12)