

## INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University  
Microfilms  
International**

300 N. Zeeb Road  
Ann Arbor, MI 48106



8421230

**Gunatilake, Sarath**

**AN EXPLORATORY STUDY OF QUALITY CIRCLES AND TEAM BUILDING IN  
TWO HOSPITAL SETTINGS**

*University of Hawaii*

DR. P. H.

1984

**University  
Microfilms  
International** 300 N. Zeeb Road, Ann Arbor, MI 48106



PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark .

1. Glossy photographs or pages \_\_\_\_\_
2. Colored illustrations, paper or print
3. Photographs with dark background \_\_\_\_\_
4. Illustrations are poor copy \_\_\_\_\_
5. Pages with black marks, not original copy \_\_\_\_\_
6. Print shows through as there is text on both sides of page \_\_\_\_\_
7. Indistinct, broken or small print on several pages \_\_\_\_\_
8. Print exceeds margin requirements \_\_\_\_\_
9. Tightly bound copy with print lost in spine \_\_\_\_\_
10. Computer printout pages with indistinct print \_\_\_\_\_
11. Page(s) \_\_\_\_\_ lacking when material received, and not available from school or author.
12. Page(s) \_\_\_\_\_ seem to be missing in numbering only as text follows.
13. Two pages numbered \_\_\_\_\_. Text follows.
14. Curling and wrinkled pages \_\_\_\_\_
15. Other \_\_\_\_\_



AN EXPLORATORY STUDY OF QUALITY CIRCLES AND TEAM BUILDING  
IN TWO HOSPITAL SETTINGS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE  
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
DOCTOR OF PUBLIC HEALTH

MAY 1984

By

Sarath Gunatilake

Dissertation Committee:

Jerome Grossman, Chairman  
William P. Golden, Jr.  
Emmanuel Voulgaropoulos  
Peter Dunn-Rankin  
Theodore F. Helmer

## ACKNOWLEDGMENTS

Many persons together with three institutions contributed to the accomplishment of this dissertation. The author extends his gratitude and appreciation to all concerned:

--The members of my committee, especially my chairperson Dr. Jerome Grossman for his guidance, support and direction;

--Dr. Elizabeth Clark for her guidance and advice as my interim advisor in the doctoral program;

--Dr. Robert McGee for his helpful insights on the statistical analysis;

--Dr. Jerrold Michael for his assistance and encouragement throughout the doctoral program;

--Dr. Makhdoom Shah for his ideas and suggestions on the first few chapters;

--The East-West Communication Institute, East-West Center, Honolulu, for funding a part of this research and in particular, Drs. Jack Lyle and Clay Vollan;

--Dr. Steve Colladay, the Director of Organizational Effectiveness Services at Kaiser Permanente Medical Care Program, Hawaii Region, for his invaluable support in setting up a part of this research in his hospital;

--Prudence Kusano, Dorothy Park, Donna Kishi and the other nurse coordinators at Straub Clinic for supporting and participating in the research at that hospital;

--Dr. Lawrence Kincaid for granting me permission to use the Galileo Program;

--Ms. Carol Serota for editing and proofreading the initial drafts of this dissertation; and

--Ms. Freda Hellinger, for doing an excellent job of editing and typing the final draft of the dissertation.

## ABSTRACT

Today's health care industry is faced with a large number of complex problems. These include: a rapid increase in medical care costs; proliferation of a number of iatrogenic diseases; a bureaucratized and dehumanized service delivery system and problems of overwork, stress and "burn out" among health care professionals. Many initiatives have been launched to deal with these problems. In recent years, attention has focused on a number of techniques generally grouped together under the term Organizational Development (OD). The latest addition to this array of change strategies is the concept of Quality Circles (QC).

Quality Circles (QC) are small groups of employees who meet voluntarily on a regular basis to identify, analyze and solve problems pertaining to their work area. QC originated in Japan for the purpose of training thousands of factory workers in quality control work. The technique is currently being applied in U.S. business and industry with encouraging results reported. More recently there has been an increased interest in human service organizations, hospitals included, in exploring the usefulness of the QC approach in dealing with organizational problems. The utilization of the technique in hospitals is now in an exploratory stage, with various pioneering efforts underway in a number of settings.

In the present study two ongoing OD programs in two hospital settings were followed up for a period of eight months. The program in the first hospital included two QC groups: one in the Bio-medical

department and the other in the Material department (warehouse). The program in the second hospital was a Team Building (TB) intervention with a group of Nurse Coordinators. The main purpose of the study was to generate information related to: (1) the usefulness of QC as an organizational change strategy within the health industry; (2) the principal differences in the mode of operation of hospital QC, as compared to their functioning within business and industry. In addition, the study was also designed to test a number of hypotheses concerning the relationship between selected intervening variables and QC outcomes.

The instruments used for measuring QC and TB effectiveness included: (1) Structured Naturalistic Observation (a form of participant observation), (2) A multi-dimensional attitude scaling procedure (Galileo); and (3) A Likert type survey instrument (designed specially for the purpose of current research). Measurements were applied on three occasions: one at the beginning of the research and the other two at intervals of four months apart. The assessment dealt mainly with the impact of QC (and TB) on employee attitudes (e.g., Responsibility, Recognition and Satisfaction) and organizational processes (e.g., Communication and Coordination). Some measurements of productivity were also taken.

Productivity improvements were observed in one QC. Though not measured quantitatively, there was evidence to indicate that the other QC also contributed to productivity improvements in its work group. The organizational processes in the two QC either declined or remained steady over the period of research while the TB group registered a gradual improvement of the same. However, these changes in the

organization processes were not statistically significant. Though both QC recorded improvements in employee attitudes only one of them was statistically significant. These differences in the two QC groups are explained mainly in terms of the leadership styles of their supervisors.

These findings are discussed mainly in the context of using QC as a vehicle for addressing problems related to the medical care industry.

## TABLE OF CONTENTS

ACKNOWLEDGMENTS . . . . .		iii
ABSTRACT . . . . .		v
LIST OF TABLES . . . . .		x
LIST OF ILLUSTRATIONS . . . . .		xii
CHAPTER I	INTRODUCTION . . . . .	1
	The Purpose of the Study . . . . .	3
	The Rationale for Current Research . . . . .	3
	Problems in Health Care Organizations . . . . .	4
	QC as a Vehicle for Organizational Change . . . . .	4
	Organization of the Dissertation . . . . .	7
CHAPTER II	QUALITY CIRCLES: HISTORY, NATURE AND THE ISSUES RELATED TO THEIR USE AS AN ORGANIZA- TIONAL DEVELOPMENT TECHNIQUE IN HOSPITALS . . . . .	8
	Quality Circles in Japan: History and Current Status . . . . .	8
	Quality Circles in the U.S.A. . . . .	10
	Growth of QC as a Diffusion of an Innovation in Organizations . . . . .	11
	QC Process in the U.S.A. . . . .	12
	Reported Success of QC . . . . .	15
	The Problems Related to the Use of Productiv- ity as an Index of QC Effectiveness . . . . .	17
	Quality Circles as an Organizational Development Intervention . . . . .	22
	Definitions and Descriptions of Key Issues . . . . .	25
CHAPTER III	THE THEORETICAL FRAMEWORK, RESEARCH PROBLEM AND THE HYPOTHESES . . . . .	28
	Review of Literature . . . . .	29
	Problems and Issues Common to QC Across Many Disciplines . . . . .	33
	Issues Related to Measuring QC Effectiveness. . . . .	34
	Lack of a Theory on Planned-Organizational Change . . . . .	40
	Theoretical Framework for QC . . . . .	46
	Assumptions Underlying Current Research . . . . .	48
	The Research Objectives . . . . .	49
	The Study Hypotheses . . . . .	52

	Overview of Research Methodology . . . . .	53
	The Limitations of the Study . . . . .	54
	The Significance of the Study . . . . .	55
CHAPTER IV	THE RESEARCH METHODOLOGY . . . . .	56
	The Research Design . . . . .	57
	Instrumentation . . . . .	60
	Structured Naturalistic Observation . . . . .	60
	Galileo System of Multi-Dimensional Scaling . . . . .	65
	The Survey of Work Groups Questionnaire . . . . .	70
CHAPTER V	FINDINGS--RESEARCH OBJECTIVES I AND II . . . . .	81
	QC Program in Hospital-A . . . . .	81
	Quality Circle-1 . . . . .	82
	Quality Circle-2 . . . . .	88
	The Team Building Group . . . . .	93
	Special Problems Associated with Hospital OD Programs . . . . .	102
CHAPTER VI	FINDINGS--RESEARCH OBJECTIVES III AND IV . . . . .	104
	Research Objective III. . . . .	104
	Measurement of Productivity . . . . .	121
	Research Objective IV . . . . .	125
CHAPTER VII	SUMMARY OF FINDINGS, DISCUSSION AND IMPLICATIONS OF THE STUDY . . . . .	135
	The Summary of Findings . . . . .	135
	Discussion of the Findings and Implications of the Study . . . . .	140
	Some General Comments about the Application of QC in Business and in Hospitals . . . . .	145
	Directions for Future Research . . . . .	149
	An Aftermath . . . . .	150
APPENDICES		
	A. GENERAL OBSERVATION FORM FOR USING STRUCTURED NATURALISTIC OBSERVATION . . . . .	152
	B. THE GALILEO QUESTIONNAIRE . . . . .	154
	C. THE SURVEY OF WORK GROUPS QUESTIONNAIRE . . . . .	157
BIBLIOGRAPHY	. . . . .	171

## LIST OF TABLES

Table		Page
3.1	Factors Influencing Outcomes of QC . . . . .	39
4.1	Means, Standard Deviations and Cronbach's Alpha Values for the Six Sub-Scales and the Entire SWG Instrument . . . . .	73
4.2	Item Analysis with All Thirty-Three Items of the SWG Instrument . . . . .	74
4.3	Means, Standard Deviations and Cronbach's Alpha Values After the Deletion of Sub-Scale 3 and Items 10, 16, 21 from the SWG Instrument . . . . .	76
4.4	Item Analysis After the Deletion of Sub-Scale 3 and Items 10, 16, 21 from the SWG Instrument . . . . .	77
6.1	Multivariate and Univariate Tests of Significance for Comparing the Process Variables of All Three Groups Over Time . . . . .	105
6.2	Multivariate and Univariate Tests of Significance for Comparing the Three Groups on Eight Process Variables . . . . .	107
6.3	Multivariate and Univariate Tests of Significance for Comparing the Group-Time Interaction Effects . . . . .	108
6.4	Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables of QC 1 with Those in the TB Group . . . . .	118
6.5	Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables in QC 1 with Those in QC 2 . . . . .	119
6.6	Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables of QC 2 with Those of the TB Group . . . . .	120
6.7	QC-1. The Number of "Picking Errors" Recorded March-September 1983 . . . . .	124
6.8	Differences Between QC 1 and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the Beginning of the Research Study . . . . .	126

Table		Page
6.9	Differences Between QC 1 and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the End of the Research Study . . . . .	128
6.10	Differences Between QC 2 and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the Beginning of the Research Study . . . . .	129
6.11	Differences Between QC 2 and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the End of the Research Study . . . . .	130
6.12	Differences Between TB Group and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the Beginning of the Research Study . . . . .	131
6.13	Differences Between TB Group and its Natural Work Group in Their Mean Scores on Five Selected Attributes at the End of the Research Study . . . . .	132
6.14	Multivariate and Univariate Tests of Significance for Comparing QC Members with High and Low Growth Need Strength Scores, on Five Selected Attributes . . . . .	134

## LIST OF ILLUSTRATIONS

Figure		Page
2.1	A Model of QC in U.S.A. . . . .	14
2.2	QC Operations . . . . .	16
3.1	A Systems Approach to Organizational-Effectiveness. .	41
3.2	Quality Circles and the Quality of Work Life . . . .	45
3.3	Theoretical Framework for Explaining QC Outcomes . .	47
4.1	Research Design and Instruments . . . . .	58
5.1	Galileo Plot - QC-1 . . . . .	87
5.2	Galileo Plot - QC-2 . . . . .	94
5.3	Galileo Plot - TB Group . . . . .	101
6.1	Changes in Communication . . . . .	110
6.2	Changes in Job Satisfaction . . . . .	111
6.3	Changes in Openness of Communication . . . . .	112
6.4	Changes in Decision-Making . . . . .	113
6.5	Changes in Leadership . . . . .	114
6.6	Changes in Coordination . . . . .	115
6.7	Changes in Perceived Influence . . . . .	116
6.8	Changes in Role Clarity . . . . .	117
6.9	Handling Clinic Records by the Warehouse-- 1981-1983 . . . . .	123

## CHAPTER I

### INTRODUCTION

Medical care in the United States is provided by means of a complex system of individual practitioners, health care organizations, private companies, voluntary agencies and government facilities at central, state and local levels. The general trend among these provider groups is to work in and through organizations. The traditional practitioner-patient relationship has become expanded to one in which there is a strong association among the patient, organization and the practitioner.

Today's health care institutions can be regarded as concentrations of professional teams organized around certain shared physical facilities. Over the years these health care institutions, primarily hospitals, have become increasingly complex, both structurally and technologically. This complexity is particularly evident in the intricate web of relationships which the contemporary hospital maintains with its clients, government agencies, professional bodies and numerous related aspects of its external environment.

The institutionalization of health care resulted in large part from the professional and social need to deliver medical care services more efficiently and equitably. These health care organizations became concentrations of a wide array of complex technologies, skilled health personnel and facilities. The coordination of the contributions of each of these sectors enabled the hospitals to reach a large number of patients with quality medical care in a more cost-effective

way. However, the same organizational mechanisms which helped to improve the quality of care and to streamline its delivery also caused many problems. These problems include: a rapid increase in the medical care costs; proliferation of a number of iatrogenic diseases; a bureaucratized and dehumanized service delivery system and problems of overwork, stress and "burn out" among health care professionals.

Many initiatives have been launched to deal with these problems. In recent years, attention has focused on a group of techniques generally grouped together under the term Organizational Development (OD). The latest addition to this array of change strategies is the concept of Quality Circles (QC).

Quality Circles (QC) are small groups of employees who meet voluntarily on a regular basis to identify, analyze and solve problems pertaining to their work area. QC originated in Japan for the purpose of training thousands of factory workers in quality control work. The technique is currently being applied in U.S. business and industry with encouraging results reported. More recently there has been an increased interest in human service organizations, hospitals included, to explore the usefulness of the QC approach in dealing with organizational problems. The utilization of the technique in hospitals is now in an exploratory stage, with various pioneering efforts underway in a number of settings. The present study grew out of one such exploratory undertaking conducted in two hospital settings in the State of Hawaii, in the United States of America.

### The Purpose of the Study

The main purpose of this research was to study two QC groups in a hospital setting with the intention of generating information related to: (1) the usefulness of QC as an organizational change strategy within the health care industry and (2) the principal differences in its mode of operating within hospitals as compared to its functioning within business and industry. The assessment dealt mainly with the impact of QC on employees' attitudes and the organizational processes such as communication and coordination. Some measures of productivity were also taken. The results of the assessment of the effectiveness of QC was contrasted with those of another long-standing OD technique--Team Building--in another hospital.

In addition the study was designed to test a number of hypotheses concerning the relationship between selected intervening variables and the outcomes of QC.

### The Rationale for Current Research

The rationale for the present study is derived from an understanding of a number of major problems facing today's health care organizations and the premise that QC can be used as a vehicle for organizational change which can help to alleviate some of these problems. The need to modify and adapt the QC technique to suit the hospital industry is also considered.

### Problems of Health Care Organizations

The underlying problems that make organizational change imperative are important to keep in mind, as the context within which this study is conducted.

Over the last decade the cost of medical care has been increasing at an alarming rate without a corresponding improvement in the overall benefits. For example, hospital costs in the U.S.--which represent 40 percent of the national health care dollar--was \$181 billion in 1981. This figure represented a 17.5 percent increase over the previous year (Everette et al., 1983). Similarly, there are many reports of inappropriate and deliberate misuse of the system (Brooke, 1973; U.S. House of Representatives, 1976).

A related problem is that the heavily bureaucratized and specialized service delivery system has created a substantial core of health professionals who share the frustration of the patients who receive their impersonal and fragmented care. Dissatisfaction, "burnout" and stress seem to take an enormous psychological toll on most health professionals. For example, 40 percent of all premature deaths among physicians are due to suicide and 15 percent of all drug addicts under treatment are medical doctors (Pfifferling, 1980). Stress and "burn-out" among nurses seem to be equally high (Brown, 1982).

### Quality Circles as a Vehicle for Organizational Change in Hospitals

QC represent an approach to organizational change that seems to be eminently suited to address the change issues mentioned in the preceding section. In industry, for example, QC have been increasingly

utilized to improve productivity and quality with tremendous cost savings for the companies which use them (Tortorich et al., 1981). In this respect, the cost containment efforts in the hospital industry may benefit from the valuable lessons learned from the QC experience in business. QC have been viewed as an important vehicle for improving job satisfaction as well as for reducing absenteeism, turnover and tardiness (Ingle, 1982). Therefore, QC may prove to be a useful method for enhancing the "Quality of Work Life" for health professionals at all levels. Similarly, QC are an effective small group technique for enhancing other broader social and political change efforts. In Japan, for example, the QC complemented the larger changes in industrial economic policy by training thousands of workers in quality control work in an effort to undertake the new venture of producing quality industrial products.

#### The Need for Modifying the QC Technique to Suit the Hospital Industry

Although QC seems to hold promise as an important and useful technique for instituting change in hospitals, many problems related to their implementation are becoming evident even at this early stage. First, the QC model that is being applied in hospitals today is an exact replica of that being used in business and industry. While granting the fact that the experience from business may be extremely useful, the hospital industry has vastly different goals, organizational arrangements and controls. These essential differences make it necessary for hospital QC programs to undergo certain modifications and adaptations before they become optimally effective. Thus far, very

little attention has been paid to this aspect of hospital QC programs. Today, there is a need to study the process of implementing QC programs in hospitals to determine "how" and "to what extent" they differ from their counterparts in business and industry.

Second, the hospital industry is notorious for adopting new Management Engineering and organizational Development programs. To list a few, hospitals have put into effect Management by Objectives, Conflict Resolution Programs, Nurse-Physician Relationship Improvement Programs, Performance Management, Periodic Organizational Reviews, Quality Assurance Programs and Open Systems Planning. Many hospital administrators have witnessed the birth and death of these programs within a short span of time. A part of this faddishness for new programs is due to the hospital industry's preoccupation with instant solutions and the inability or unwillingness to see the long-range consequences of some of the "quick fixes" they try (Schein, 1981). To avoid becoming a fad, hospital QC programs need to be launched with careful planning with a heavy emphasis on measuring and evaluating results. Most of the QC results reported today are anecdotes of achievements gained in respect to productivity and employee satisfaction. If QC are to become a viable tool in improving the delivery of medical care, it becomes imperative to evaluate the results of these programs with more scientific rigor and compare them with results obtained from other management initiatives already existing in the field. Again, this aspect of QC has been given very little consideration (Everette et al., 1982).

Some hospital QC programs have also encountered special problems in terms of obtaining physician participation and scheduling meetings.

In addition, being a relatively new technique, QC programs across all disciplines are faced with the problem of not having an adequate theoretical framework to explain their outcomes. Therefore, despite our getting satisfactory results with a QC program, we are still left with the questions of why and how they worked. These issues will be discussed in more detail in Chapter III.

### Organization of the Dissertation

This report is organized into seven chapters. Following the introduction, Chapter II describes the history, development and spread of QC both in Japan and the United States. Chapter III reviews the relevant literature and develops a theoretical framework for the study. The same chapter also details the study's major research objectives and the hypotheses. Chapter IV describes the study design and the research methodology employed in the study. The findings of the study are detailed in Chapters V and VI. Finally, the implications of these findings and the directions for future research are discussed in Chapter VII.

## CHAPTER II

### QUALITY CIRCLES:

#### HISTORY, NATURE, AND THE ISSUES RELATED TO THEIR USE AS AN ORGANIZATIONAL DEVELOPMENT TECHNIQUE IN HOSPITALS

During 1980 approximately 400 U.S. firms started Quality Circle (QC) programs. This figure rose to an estimated 750 corporations and governmental agencies in 1981. By the beginning of 1982 it was estimated that 1500 companies in the U.S.A. were implementing QC programs. Indeed, so popular is this philosophy in this country, it is in the danger of becoming the management fad of the eighties. (Zahra, 1982)

In this chapter the historical roots of QC in Japan and the United States are described first. Secondly, the growth of QC within U.S. industry and its subsequent spread to hospitals is analyzed from the perspective of 'diffusion of innovations in organizations'. Thirdly, an overview of the QC process in the U.S. is described, accompanied by a critique of the use of 'productivity' as an indicator of QC effectiveness in hospitals. Finally, the pros and cons for classifying QC as an Organizational Development (OD) technique are discussed.

#### Quality Circles in Japan: History and Current Status<sup>1</sup>

QC originated in Japan in 1962. After World War II Japan's industrial leaders realized that the future of their country depended partly upon a productive economy which, in turn, depended upon the

---

<sup>1</sup>The discussion in this section is derived mostly from the work of Zahra (1982).

production of quality goods and services. One of the early steps instituted to upgrade the quality of Japanese industrial products was a massive training program dealing with quality control. Among the group who pioneered this program were two Americans--Deming and Juran--who introduced modern quality control techniques from the U.S. to the Japanese industry. Most of the foremen who received quality control training wondered 'what to do with the knowledge they received'. Someone asked "why not form small groups in the shop to teach the workers these techniques? Why not spread the knowledge and ask their help in solving daily problems? After all, who knows the job best?" This was how the QC began in Japan.

Ishikawa is credited with the invention of the QC concept. His major contribution was to tie together several theories of motivation, small group dynamics and quality control, to formulate a complete training package for the workers. Yet, it was only through the diligent efforts of the Japanese Union of Scientists and Engineers (JUSE) that the QC idea became known. The first QC was registered with JUSE in 1962. Immediately after JUSE embarked on a challenging effort to develop the training materials necessary to operationalize the new concept on a national scale. Training seminars for all organizational levels were held throughout Japan using a variety of media including the radio. So successful were the efforts by JUSE that, by 1972, the number of QC reached half a million. In Japan today it is estimated that one million circles are in operation and about nine to ten million workers are involved in QC activities (Zahra, 1982).

Two important points need to be recognized with respect to development of the QC in Japan. First, QC were developed only as a part of a comprehensive package to achieve worldwide prominence with respect to the quality of their industrial products by the Japanese. The other efforts included changing import-export regulations and redefining the relationship between business and government (Hunt, 1981). Thus, QC were only one factor responsible for the dramatic quality revolution achieved by Japan. It would be extremely dangerous for anyone to assume that QC were Japan's only means of improving productivity and quality, albeit a potent one.

Secondly, it is important to note that, although the initial emphasis of QC was on product quality this was later followed by a significant interest in the areas of Quality of Work Life and Leadership development (Nakazato, 1976). Today QC in Japan are widely considered to be a "key part in a broad national effort to move towards more participative organizations" (Rehder, 1981).

#### Quality Circles in the U.S.A.

The amazing improvements in Japanese productivity generated a great deal of interest in QC techniques among U.S. business and industrial organizations. In 1974, the first American company to experiment with the QC concept was Lockheed Missile and Space Company, Sunnyvale, California. Subsequently, other companies such as Honeywell, Northrup, Hughes Aircraft, Hewlett-Packard, General Motors and Ford Motor Company developed similar programs. Following the initial success of these companies as many as eighty others were involved in QC programs

by the year 1978. By 1981, this figure increased to 750 and doubled itself within the next year (Zahra, 1982).

Interest in QC has been growing in other areas of the world as well: Taiwan and Korea have already used the technique and have been reaping the benefits. Recently, Mexico, Brazil, Argentina and China have also started QC programs. In addition, many human service organizations such as hospitals and banks have also begun to make use of the concept.

#### Growth of QC as a Diffusion of an Innovation in Organizations

Organizational research indicates that the development and diffusion of innovative programs such as QC follow a pattern similar to that of the diffusion of medical technologies and drugs (Rogers & Shoemaker, 1971). Everette et al. (1982) applied the classical diffusion of innovations model to the adoption of innovative management programs by organizations. They describe the adoptions of a new program like QC using a three stage process:

In the first stage, risk taking or innovative organizations develop or adopt new programs, based upon definitive needs and an experimental spirit. These innovators usually make the program effective by hard work and willingness to learn by trial and error. In the second stage, other organizations, "early adopters" learn of the initial successes and also begin the program in earnest because of well articulated needs. In the third stage, continued success results in many more organizations initiating the program, sometimes for wrong reasons. During this last stage failures and disenchantments may occur.

Evaluated according to this model the business and industrial organizations in the U.S. have reached almost the third stage of the diffusion process. In comparison, hospitals and other human service

organizations implementing QC are still at the end of the first or at the beginning of the second stage. In fact, there is good evidence to show that the disenchantments characteristic of the third stage are now beginning to take place in many business organizations. For example, Everette et al. (1982) report:

Unfortunately an estimated one fourth of the manufacturers implementing Quality Circles recently are experiencing program failure. These failures result from a number of shortcomings such as: the organization not carefully considering whether Quality Circles are appropriate for them, from a lack of careful planning, and from an expectation of easy payoff without expending the necessary resources.

#### The QC Process in the U.S.

Quality Circles are small groups of employees who meet regularly to solve problems which pertain to their work areas. These groups average about eight to ten members. Participation in QC activities is voluntary and the members also have the option of leaving the program if they elect to do so for any reason.

Originally the Japanese QC addressed product quality problems only. However, as the concept matured, both U.S. and Japanese QC began addressing issues wider in scope than product quality. Hence, labelling the circles Quality Control Circles is a 'misnomer'. As Rendall (1981) comments:

The recent trend to delete the word "control" from the original Quality Control Circle programs might indicate a move away from quality control as the primary goal. But this is not so. In a Quality Circle program "quality" may refer to quality of product, quality of service or even the quality of work life.

The continuation of QC activities in a firm is achieved at two levels. The first level consists of a steering committee which plans for and evaluates the program results. The second level of coordination is represented by the program facilitator(s). A facilitator is responsible for operationalizing the steering committee's plans. In addition, the facilitator trains the individual QC leaders and attends weekly QC meetings, helping the leader to manage the meeting and its group process. He also schedules and assists the group to prepare their management presentations once the group has arrived at a solution to a particular problem within their work area. The organizational arrangements involved in implementing QC in U.S. firms is depicted in Figure 2.1.

The leaders of individual QC play a most crucial role in determining the success of the circles. They are required to coordinate the activities of their respective QC, to conduct meetings, to motivate the members and maintain their enthusiasm. Most frequently but not always, the leader is the formal supervisor of the work group involved in the QC. QC meetings are usually held once a week on company premises. In one survey, the majority of the firms (80%) indicated that they pay the QC members for meeting time (Ingle, 1982).

QC use many statistical techniques in determining the extent and the cause of the problems. Therefore, during the initial meetings the QC members undergo training in these statistical techniques. Thereafter, they follow a structured process of problem identification, problem analysis, solution development and management presentation

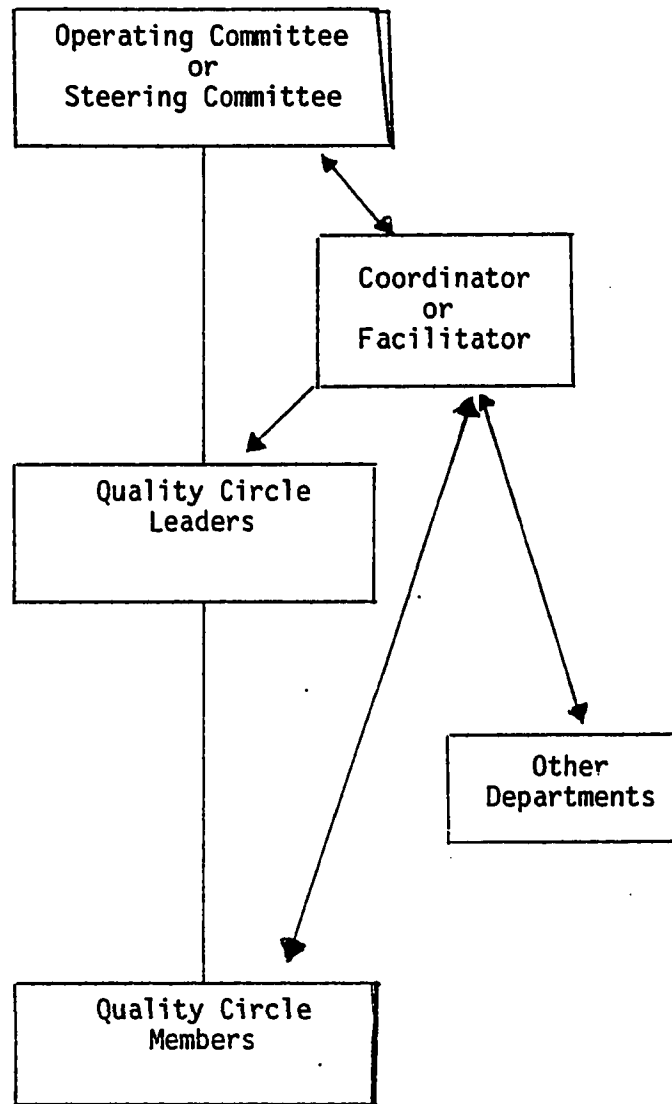


Figure 2.1. A Model of QC in the U.S.A.

Source: Sud Ingle, Quality Circles Master Guide (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1982), p. 12.

to gain approval prior to implementing the proposed solutions. Figure 2.2 depicts these different phases involved in QC operations.

### Reported Success of QC

Results are being achieved by QC in a number of areas. For example QC have been described as a useful method for achieving high quality, improved productivity and increased employee morale at a relatively low cost (Ouchi, 1981). It has been noted that it is common to realize three to six dollars in cost savings for every dollar invested in the circles (Irving, 1978). In fact, the Westinghouse experience has shown that "use of QC have led to significant quality and productivity improvement" (Murrin, 1980). In some cases 40 to 50 percent improvement in productivity was attributed to the use of circles (Kanarick, 1981). The circles may impact productivity in several ways. Many QC deal with technical problems directly related to productivity. The resolution of these problems, therefore, will have a direct impact on productivity. On the other hand, QC can affect productivity by improving organizational processes such as communication and coordination or by enhancing employee morale and satisfaction. In addition QC are believed to provide an added sense of responsibility, recognition, challenge and autonomy to its members. It is postulated that these psychological states would act as important motivating factors for improving employee performance. The relationship between these intermediate variables like communication, motivation and satisfaction and the improvements in productivity are discussed in more detail under the section on theoretical framework in Chapter III. What should be noted here is that these postulated

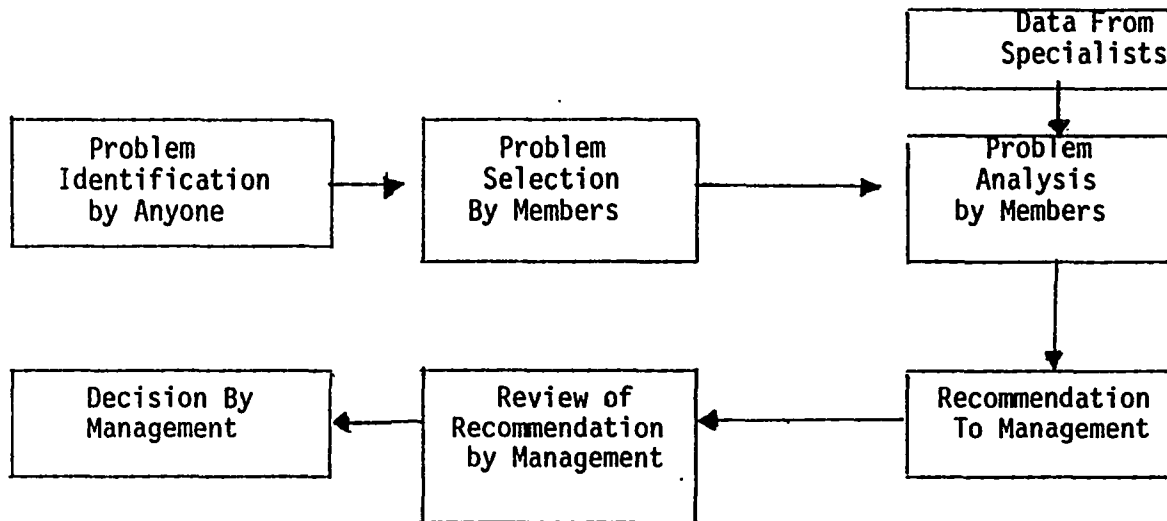


Figure 2.2. QC Operations

Source: Donald L. Dewar, The Quality Circle Handbook (Red Bluff, CA: Quality Circle Institute, 1980), p. F4-1.

relationships are merely speculative and that most of the reported improvements in productivity are also anecdotal.

The Problems Related to the Use of Productivity  
as an Index of QC Effectiveness

According to Cole (1979) the primary purpose of QC is to improve quality and productivity. As shown in the preceding paragraph there is no doubt that many QC are successful in these two areas. The main reason why the American industries re-imported the QC concept was their desire to duplicate the productivity improvements which the Japanese companies enjoyed. However, there is one fundamental philosophical difference between the QC movements in Japan and the U.S.: The original purpose of the Japanese QC movement was to improve the quality of their industrial products. Shortly thereafter the movement adapted motivation theories and small group techniques developed in the West and became more of a national effort geared towards encouraging participation and enhancing the quality of work life for its employees. This is also consonant with the basic tenets of Japanese management which encourage group participation and the development of consensus at all levels of the organization. The Japanese firms also have a tendency to take care of the employee as a 'whole person' considering his needs both within and outside the work place. Therefore, many companies view the improvements in the quality of work life brought about by the QC as a way of fulfilling this obligation.

In contrast, the main idea behind implementing QC in U.S. companies was to improve productivity. As one article claimed "the need for QC has grown out of the concern of the top management for the decline

in productivity" (Lindzay, 1982). Improving the quality of work life or job satisfaction and participation were pursued insofar as they contributed to the original purpose of improved productivity (Rendall, 1981). The pursuit of productivity improvements even without adequate emphasis upon the needs of the employees can be somewhat justified in view of the productivity decline experienced by U.S. business and industry over the last decade (Macy, 1981). However, what is more unfortunate is that in most hospital QC programs the same productivity goals have now displaced the original mission of these institutions with respect to improving the health status of the populations which they serve. For example as one article reported:

By following the same concept the Japanese have followed for several years, the American industry have improved quality and productivity while reducing costs. As a result of this success hospitals are following in the footsteps of industry to achieve the same goals.<sup>2</sup>

The following section will discuss the inappropriateness of using productivity as an index of QC effectiveness by the hospital QC programs.

#### Hospital QC and Productivity

The National Council on Health Planning and Development (1980) defines productivity as "seeking the development of greatest possible efficiency, effectiveness and quality with a given set of personnel and technological resources." This is useful as a general definition of productivity. However, within the health care industry productivity means different things to many people. For example, the same council questioned 200 health care organizations for their operational definition of productivity. The analysis of the answers revealed that

---

<sup>2</sup>See "Hospital Quality Circles Improve Productivity," Hospital Peer Review, 6(9), 1981.

"no one sector--government or private, provider or payer, professional or consumer--had responded with consistency or cogency."

Economists define productivity as the "ratio of outputs to the inputs." Productivity improvement is therefore a change in this ratio in a positive direction. In health care an important constraint is put on this definition: "while maintaining the quality of care."

Therefore in order to measure changes in productivity we need to measure 'inputs', 'outputs' and 'quality'. In health care, the inputs are well defined and fall into the broad categories of capital and labor. However, the final output of the industry--health--is elusive. There is no well-accepted measure of the overall health status. Therefore, instead of attempting to measure health status the industry has taken an easier shortcut by concentrating its efforts on identifying certain intermediate outputs that are supposedly effective in elevating the health status of the people. Examples of these intermediate products include physician visits, hospital days, and the number of procedures performed. In fact, so frequent are the uses of these intermediate output indicators that many hospital administrators are now conditioned to think of these as ends in themselves rather than as means of achieving the final end product of improved health status. This practice of using productivity as a performance criterion within the hospital industry has resulted in two main drawbacks.

The first is a shift of emphasis from effectiveness (in improving health) towards concentrating on the efficiency of producing intermediate outcomes. Efficiency is a short-hand term describing the production of the same output with the smallest necessary expenditure

of resources. Discussing efficiency does not require identifying the products with any precision. Therefore, effects of cost containment programs in hospitals has been to bring pressure to bear upon the institutions to conserve resources and become more efficient in producing the same products (such as patient visits and hospital days). In this process very little attention has been paid to assess whether these products are actually effective in improving the overall health status of the people. As a result, the hospital industry has accumulated a wide array of tremendously expensive life-saving technologies at the expense of health preserving procedures. This point is best illustrated with the case of various special care units in hospitals. For example, despite the general acceptance of coronary care units, considerable controversy exists over their effectiveness and the ratio of benefit to cost (Mather et al., 1971, 1976; Blum & Peterson, 1973). Griner (1972) has made similar observations about hospital intensive care units. Therefore, an attempt to increase the productivity of these special care units without asserting their effectiveness may not contribute at all to improvements in overall health. There is no doubt that we are 'buying the best' of the services from these special care units. However, there are serious doubts as to whether these services are the 'best buy' in terms of reaching the goal of improved health status for the nation. There are many of us who believe that the broader issues of accessibility and equity of services could only be addressed by fundamental changes in the way in which health care is organized, financed and delivered. The present discussion on narrow institutional and technological productivity has blunted the initiative for creativity, individuality and deviancy

which may be the starting point in planning for such alternative health care services. As Myrdal (1968) wrote:

The modern discussion has been concerned with parts of the problem rather than the whole. We have probably wasted a great deal of time and effort doing things which are right in themselves but, which made little or no contribution to progress because they were done in an environment which was inconsistent with advance.

Second, an undue emphasis on productivity could lead to a situation which completely ignores the 'process' by which the products are generated. In fact, this quest for productivity within the hospital industry reflects a fundamental difference from the approach of many community development movements which are concerned with the health status of the people both as a prerequisite and a consequence of development. According to the philosophy of the Sarvodaya movement in Sri Lanka:

In our movement there is no dichotomy between ends and means. The ends and the means merge together. If the roads we constructed were to be wasted by floods or closed by a dissatisfied minister of state, still, the benefits we accrued in the process of building it together, that enriched our personalities, remain with us. It teaches us the noble principle of cultivating equanimity: not to be daunted by failure but being rich with experience to strive again. (Ariyaratne, 1978)

In health care we are dealing with the benefits of a process that cannot be evaluated in terms of narrow productivity measures or any other monetary outcomes. In fact, attempts to improve productivity in one sector of the health service may be construed as a move towards lowering productivity in another. For example, extra time spent with patients in outpatient care (with a consequent decrease in the productivity of the health personnel involved) may reduce far more costly in-patient services, especially in the case of chronic diseases. On the other hand, attempts to increase productivity by cutting short

a visit with the patient may leave the patient dissatisfied and precipitate a second visit to the same or a different provider.

To summarize the above discussion suggests that the productivity assessment in hospital settings is not being guided by the principled considerations that ought to govern matters of such gravity and concern. The imposition of a schema from industrial engineering cannot fully accommodate the facts when questions regarding human life and death are being formulated only in terms of productivity. Yet, the hospitals will continue to monitor productivity in terms of the intermediate technological and personnel outcomes as long as they are being held accountable in those terms by federal, state and professional agencies. As such, the current research will assume the position of accepting the presently-used productivity indices (such as nursing hours per patient day, hospital day, etc.) as an indication of QC effectiveness within hospital settings. However, in the final discussion the results of the achievements of these QC will be evaluated in terms of their effectiveness in improving the overall health status.

#### Quality Circles as an Organizational Development Intervention

Organizational Development (OD) is exactly concerned with what the words imply. First, it deals with the organization and all the critical factors and resources that constitute an organization. Second, it is concerned with development, which implies a focus on effectiveness, improvement, learning and problem-solving. However, it is difficult to give an overall, encompassing, precise definition of the term. As a result, more than a dozen such definitions exist today within the field. Rather than trying to select the best definition

out of these, it is more useful to highlight the main characteristics emphasized by the majority of the definitions. We will then be in a better position to make an assessment of the extent to which QC conform to these characteristics. Burke (1982) provides a useful description of a number of popular definitions of OD. These definitions indicate that:

- a) It is a method of inquiry that often involves collection of valid information about some issue or problem and the mutual understanding of that data by those who give it as well as collect it.
- b) It usually involves one or more change agents. It is concerned with the relationship between the change agent or the consultant and the client organization (or a part of it) that has a problem and seeks to improve itself.
- c) It is based on humanistic values. All OD technologies and strategies reflect a concern for the 'health' of the individual within a larger social system. The practice of OD has grown from and continues to advance the general value premise that individuals will be more productive and more personally enriched if they are given the greatest possible opportunity to have a say in what they do and how they conduct themselves in a work setting.

Judged from this perspective can QC be classified as an OD technique? The answer is both 'yes' and 'no'. 'Yes' because the QC represent a management philosophy of trust in workers by allowing them to be more involved in the work process and by committing more

resources for the growth and development of the employee within the work setting. QC are also concerned with building teamwork within natural work groups and opening up channels of communication between the employees and management. The QC facilitator is more than a program coordinator. He is also a change agent involved in changing the organization's culture and the management practices towards more participative principles. This role clearly demands a knowledge of organizational systems, management theory and a high level of competence in understanding and managing group dynamics

On the other hand, the answer would be 'no' because, unlike most other OD interventions, QC do not start with an organizational diagnosis. Instead many QC deal with a large number of technical problems that affect the production process. Some of the problems solved by QC may have a large impact on the organization in terms of improving the technical operations. However, these solely technical improvements do not carry with them the humanistic values for them to be labelled as OD interventions. As such the QC within U.S. business and industry are far more productivity oriented than OD oriented. The training of the facilitators reflects this bias. As Metz (1981) comments "from the facilitators I have met so far, it appears that most do not even have a minimum basic understanding of O.D. or the know how to go about managing and influencing organizational change."

However, there are many experts in the field who feel that the inadequate emphasis on OD principles is a serious shortcoming in the QC movement. For example, Metz (1981) points out that "not emphasizing the OD implications of QC is an important cause for failure or lack of effectiveness of QC programs." Similarly, Rendall (1981) comments:

a shortsightedness on the part of American management is evidenced by their viewing the benefits accrued to employees as secondary and not in and of themselves sufficiently important to warrant implementing or continuing a QC program . . . I submit that QC type activities which have been viewed by management as "luxuries" will soon be seen by employees as a job requirement . . . It is time to move the QC from the auspices of the engineers to the trainers, who can not only help circles to achieve the cost effectiveness goals but also are better equipped to foster the personal growth of the QC participants.

### Definitions and Descriptions of Key Issues

The following section will define and describe certain key terms that appear repeatedly throughout this dissertation.

Organization: The company, agency or institution which employs the employees who serve as subjects for this research.

The Supervisor: The person to whom a single employee or a group of employees report. In some cases an individual employee may report to two or more supervisors. For the purposes of this research the person who supervises an employee for the majority of his or her work time is considered as the primary supervisor.

Work Group: All the employees who report to the same supervisor constitute a single work group. This is the basic building block of an organization. One employee may belong to more than one work group within the same organization. For the purposes of this research, the work group with which an employee spends the majority of his or her time is considered as the primary work group. The words "work group" and "work unit" are used interchangeably in this research.

Department: Refers to a part of the organization which carries out a single function or a number of related activities involving two or more work groups.

Survey Feedback (SF): A survey is a method of gathering information from people. It can be done by interviews (in person or by telephone) or by paper and pencil questionnaire. Survey Feedback is an OD technique where the data collected from an organization (or a meaningful sub unit of it) is tabulated, summarized and fed back to the same employees who helped to generate that data. This would help them to identify and define problems existing within their work situation and to develop action plans for solving them.

Team Building: A team is any group of two or more persons who must coordinate with each other in order to complete some task. The effective coordination of the resources of a team depends to a large extent on:

- a) their ability to specify the team's goals and objectives (i.e., what they should do);
- b) the clarity with which they define each other's roles (i.e., who should be doing what);
- c) the procedures involved in going about with their activities (i.e., how things are done);
- d) the way in which the interpersonal issues and relationships are handled.

Teams do not develop effective work groups by chance, fate or over time. It requires guidance and practice for a team to achieve a level of optimum effectiveness. Team building is any planned activity which helps a team to manage their goals, roles, procedures or interpersonal relationships.

Organizational Processes: Accomplishing an organization's mission requires the use of technology, a social structure and a set of organizational processes. By technology we mean the machines, equipment and, most importantly, the process whereby the raw materials are transformed into desirable goods or services. Social structure refers to the arrangements of people in the organization with regard to functions such as hierarchy, interdependence, communication. In addition to these social and technical arrangements, the organization needs a set of mechanisms to enable the socio-technical system to perform its work. These mechanisms are called organizational processes and include functions such as communication, coordination and decision-making.

## CHAPTER III

### THE THEORETICAL FRAMEWORK, RESEARCH PROBLEM AND THE HYPOTHESES

The extremely rapid growth of Quality Circles within U.S. business and industry has been described as a "Quality Circle explosion" (Yager, 1981). What followed this explosion was an inundation of various business journals and periodicals with articles about Japanese management and QC. For example, during the latter half of 1980 alone, one author found more than 35 articles about QC in a single company library (Metz, 1981). Most of these articles either describe the QC technique or are written in glowing words telling how successfully the concept is being applied in U.S. business and industry. Only a few of these articles provide objective data which help us in assessing the effectiveness of QC as a management initiative. Literature on QC failures or problems are even rarer (Metz, 1980).

In this chapter a number of relevant articles that provide evidence with respect to QC effectiveness are reviewed. This is followed by an in-depth discussion on our limited experience in applying QC in hospital settings. The main purpose of this discussion is to delineate those special problems and issues encountered by hospital QC programs. Next, the problems and issues common to QC programs across many disciplines, are reviewed and summarized. One of the major problems highlighted in this discussion is the lack of a theoretical model which explains why and how the QC affect the reported outcomes such as productivity, employee motivation and job satisfaction. Drawing from a number of mini theories and models already existing within the field

of OD, an attempt is made to synthesize a theoretical model that could explain most of the QC outcomes. This is followed by a statement of the problem to be addressed in the current study, the research objectives, the hypotheses to be tested and the significance and limitations of the research.

### Review of Related Literature on Applying QC in Business and Industry

One of the most recent attempts to evaluate the impact of QC by collecting "hard data" came from the Martin Marietta Aerospace Study (Tortorich et al., 1981). In this study QC effectiveness was measured for over a period of one year by collecting pre- and post-intervention data on a number of individual and organizational outcomes. These measures included satisfaction with the job, co-workers and the supervision. Production and defect rates, lost time, accidents and grievances were also monitored. On the basis of these criteria the employees who were members of QC were compared with their co-workers who were not a part of the QC program. In all instances the QC members scored better than non-member employees.

Hunt (1981) conducted a similar pilot program for six months at the Pomona Division of the General Dynamics Corporation. The main question addressed in this study was 'Can QC successfully address productivity and human resources needs at general dynamics?' Productivity in six QC were monitored in terms of reduced attrition, higher performance, improved quality of the products, the number of employee suggestions and specific projects. The results showed that there were

statistically significant differences in the performances of the QC members when compared with non-member employees.

Not all studies on QC have reported continued success. One study which sounds a cautionary note on blind acceptance of QC is the University Research Center of Chicago study conducted by Goodfellow (1981). After studying twenty-nine U.S. companies with QC programs, the Center found that most of them were unsuccessful. Only eight of the twenty-nine produced satisfactory results. The basic element that crowned the eight companies with success in their programs was the nature of their supervisory training.

#### Review of Literature with Respect to the Application of QC in Hospitals

Unlike the case of business and industry, the number of reported applications of QC in hospital is very few. Among these, one of the most up-to-date and comprehensive surveys is the one conducted by Avatar International Inc. (Everette et al., 1983). Sixty-one hospitals which are currently operating QC were included in this survey. One of the most important findings of this study was that the goals of hospital QC programs were quite different from those of business and industry. In the business world the objectives of most QC were to increase productivity by producing quality goods and services with minimal cost. Reducing employee dissatisfaction is seen as a means of motivating the workers towards this goal (Gryna, 1981; Nelson, 1980). However, the most highly ranked objectives in hospital QC programs were improved communication, cohesiveness, team spirit, employee involvement and

improvement of quality of care. Productivity improvements and cost containment, though considered as important, were ranked below the above goals by the hospital administrators and QC facilitators.

The same study reported that the mean frequency of QC in patient care departments (e.g., pharmacy, lab, emergency, operating room, etc.) was slightly higher than that of support service departments (e.g., medical records, accounting, housekeeping, etc.). However, within the patient care departments, those departments which maintain direct contacts with the patient throughout the day (e.g., emergency, cardiac services, etc.) operated a significantly fewer number of circles within them, as compared to departments which do not maintain such direct patient care responsibilities. These included the departments such as pharmacy and lab. It seems that these direct patient care departments may be having significant staffing and scheduling problems which make it difficult for them to implement QC requiring meetings on a regular basis. For example, describing his experience in a 487 bed hospital, Waszark (1982) mentions that scheduling problems is a predominant concern in implementing QC in hospital settings.

The Avatar study also reported that physician interest in QC was noted only in 13% of the hospitals surveyed. Weisboard (1978) provides an in-depth discussion as to the reasons why physicians fail to embrace the concepts of OD. His reasoning includes the socialization patterns of the physician, the loosely integrated nature of the hospital bureaucratic system and its multiple lines of authority. These same concerns voiced by Weisboard may be valid with respect to physician participation in QC as well.

In the absence of pre- and post-intervention data for most hospitals, the Avatar study based their evaluations of the effectiveness of the QC programs on the opinions and perceptions of the hospital administrators and QC facilitators. The number of hospital administrators and QC facilitators who admitted that the QC had some positive impact on communication, cooperation and employee involvement, ranged from 62.4% to 83.3%. However, these same respondents were very much uncertain about the effect of QC on improved operations, cost containment, and decreased absenteeism. The percentage of administrators and facilitators who answered that they 'Do not know whether the QC made any impact on these outcomes' ranged from 62.4% to 83.3%. This may partly be due to the fact that 'hospital productivity' has yet to become a well-defined entity. Adopting a very pessimistic view about the future of QC in the hospital industry, Brody (1982) stated that "The problem is that hospitals to a remarkable degree still are not productivity oriented in their compensation systems. They largely lack the mechanisms to recognize, measure, and reward productivity either qualitatively or quantitatively." Baird (1981), Buback (1981), Geldbach et al. (1981), Helmer (1982), Johnson (1981), Moore (1982), Terry and Alexander (1982) provide other examples of reported QC programs in hospitals.

The results of the review of our experience with hospital QC programs can be summarized as follows:

- 1) The number of reported applications of QC within hospitals are increasing rapidly.

2) Hospital administrators see improved communication, coordination and employee involvement as the most important outcome of their QC programs. Although there is very little objective data to substantiate their claim, at least some administrators feel that the QC programs are capable of improving these organizational processes within the hospitals.

3) Productivity improvement and cost containment assume a low priority when compared to the improvements in organizational processes. There is some doubt whether the hospital QC programs really address these issues.

4) Hospital QC movement has also met with some special problems in terms of staffing, scheduling and involvement of physicians. This may be the reason why QC are not as popular among direct patient care departments.

#### Problems and Issues Common to QC Across Many Disciplines

In addition to the special difficulties discussed above, the hospital QC movement has inherited a number of problems along with the QC model which it borrowed from business and industry. These include:

1) The problems involved in measuring the impact of QC on productivity and organizational processes such as communication and coordination.

2) The problem of demonstrating that the QC have actually caused the outcomes mentioned in (1); i.e., the problem of the lack of internal validity.

3) The problem of establishing a theoretical framework to explain the action of QC outcomes specified in (1).

#### Issues Related to Measuring QC Effectiveness

One of the main problems evident from our experience in applying QC in business and industry is the lack of a systematic methodology for evaluating QC effectiveness. As mentioned before, the amount of literature available on 'great success stories of QC' is enormous. Yet most of these available reports are anecdotal, subjective and limited in breadth. Not many of the findings cited in these articles can be considered as scientific evidence for deciding whether the QC were a success or a failure in those situations. However, the problem of the scarcity of well-designed evaluative research is not unique to QC alone. In fact the problem extends beyond the QC movement to the larger field of OD and to many other behavioral science disciplines as well. The lack of well-designed, evaluative studies amongst QC literature may be due to two reasons. The first is the lack of a theory of a 'planned organizational change'. (This issue is discussed in more detail in the following sections.) In the absence of a theory, the researchers do not know what to look for and where to look. The second reason is the widening gap between the researchers who represent academia and the possible users of research who include the managers and the QC facilitators. Today most managers have learned to rely on their 'gut reactions' for managerial decision-making, rather than base their decisions upon the findings of high flown academic research. Beer (1980) states:

There is very little evidence to prove that O.D. efforts have been terminated because rigorous scientific assessment of a change was not carried out. Similarly rigorous evaluation research by itself has not been shown to add to the momentum of system-wide change. . . . Managers simply do not use that type of data in deciding to continue or discontinue O.D. . . . Perhaps they prefer to use direct experience. If evaluation does not enhance the spread of O.D. and if managers do not pay attention to rigorous evaluation, why do them?

While arguing for the contrary, the same author has presented five purposes that a rigorous evaluation of a QC program (or any other OD effort) may serve:

- 1) To determine the impact of the program on organizational behavior and performance.
- 2) To determine whether the program strategy should be modified.
- 3) To collect data that will be useful in selling the program to the decision-makers.
- 4) To upgrade intervention skills and methods.
- 5) To contribute to knowledge about organizational behavior and change.

It is not possible to address all these issues in a single research study. Therefore, the QC researcher must be clear as to the purpose of his research and design his data collection accordingly. The decision to select among an array of evaluation techniques and outcomes is indeed a value-laden one. Such a process warrants a clarification of the researcher's own values as well as those of the clients he will serve. There are many other questions that surround the issue of measuring QC effectiveness. Some of these deal with problems such as 'defining the outcome measures used for data gathering' and dealing with the changes that may occur within these same outcomes during the

process of research. The changes that may take place as a result of the QC intervention may lead to a 'reconceptualization of the definitions used for the outcomes' or perhaps a recalibration of the instrument used to make the pre-intervention assessment.

#### Problems due to the Lack of Internal Validity

If one were to evaluate a QC intervention and arrive at the conclusion that the desired changes did occur within a particular organization, could one then state with confidence that it was the QC program which brought about those changes? As French and Bell (1982) describe it: "There is simply so much going on in the real life situation that it is difficult to pinpoint what is causing the changes that occur." If one is not aware of this possibility, all the changes that may take place after the implementation of a program may be erroneously attributed to the effects of the intervention. On the contrary many unsuccessful attempts at organizational change may be interpreted as failures of a particular technique although a multitude of other factors may in fact be responsible for such outcomes. How can we then separate the effects of a particular QC program from those of a multitude of other factors affecting the same outcomes that we are planning to measure? One way to overcome this problem is to carry out a carefully planned controlled experiment with one or more matched controlled groups used for comparison. However this is almost impossible to achieve in most organizational settings.

In the absence of pure control groups--the true experimental design most suitable for research purposes--Campbell and Stanley (1966) have proposed what they call quasi-experimental designs. These designs,

though not always perfect from a research perspective, provide ways of controlling certain conditions so that validity will be enhanced.

If, after having done the best possible job in designing the research and having come to the conclusion that the QC program did produce some beneficial results, the researcher still has to answer one more question if his research is to be useful to the practitioners. The question to be asked is 'What is it in the QC program that produced the observed results?' What is included under the rubric of QC is a potpourri of activities that can vary significantly from one situation to another. As Khan (1974) stated with respect to OD, "It is not precisely defined or not reducible to a specific uniform observable behavior." Although QC are a little more well defined than most other OD techniques, Khan's comments hold true for them as well. Therefore, the practicing manager is 'in the dark' in deciding 'which QC program or what events from a particular circle should he duplicate in his own situation. Leadership qualities (Austin, 1979; Adams, 1982), supervisory training (Goodfellow, 1981), abilities of individual members (Hoffman, 1978), management support and other resources (Keefe, 1981), union support (Helmer, 1982) have all been cited as the most important success imperatives for the QC programs. Given our present state of knowledge with respect to measurement in social sciences, we may not be able to measure the exact contribution of each of these factors in most situations. However if we could classify all the variables involved in a QC intervention into some broad categories, then we may be able to make some intelligent guess as to the relative contributions of each group of variables. As White and Mitchell (1976) comment, "Such a classification of variables is an important and fruitful

exercise." In classifying factors involved in an OD intervention they use the term "facet" to describe each broad category of factors: the component variables of each category (or facet) are called "elements." Using this method of classification it is possible to conceptualize organizational change outcomes as being affected by three facets or dimensions. These include (1) competence of the personnel involved; (2) organizational readiness factors, and (3) the efficacy of the technique itself. Table 3.1 provides a list of individual elements (or factors) responsible for QC outcomes categorized under these three facets. It should be noted that these facets are not exhaustive by any means and that they represent the authors' way of conceptualizing important facets or dimensions affecting planned organizational change.

In OD literature today there is an abundance of papers which assume the position that one of these categories of factors is more important in determining the OD outcomes than the others. For example, Pfiffer and Johnes (1978) assume that OD readiness factors are the most crucial variables with respect to organizational change. They wrote:

An intriguing parallel exists between the concept of organizational development (O.D.) readiness and developmental trait of 'reading readiness'. Once an individual child is ready to read it is somewhat immaterial what teaching method is used. . . . In an analogous way once an organizational system has the necessary prerequisites change is likely to take place regardless of which methodology is applied.

Similarly, Blake and Moutan's (1978) new managerial grid, Likert's (1967) system 4 and Hersey and Blanchard's (1977) situational leadership are three OD interventions which take a strong position with respect to the competencies of the personnel involved and assume that

Table 3.1  
Factors Influencing Outcomes of QC

ORGANIZATIONAL READINESS	EFFICACY OF THE TECHNIQUE	COMPETENCE OF PERSONNEL
<p>SIZE (of the Organization)</p> <p>GROWTH RATE (whether undesirably high or low)</p> <p>CRISES (potential positive or negative influence)</p> <p>MACROECONOMICS</p> <p>OD HISTORY</p> <p>ORGANIZATIONAL RESOURCES (Time, money and access to people)</p>	<p>DIVISIBILITY (the possibility of implementing the program on a limited basis)</p> <p>COMMITMENT (in terms of resources)</p> <p>MODIFICABILITY (of the program)</p> <p>COMMUNICABILITY (of program related information)</p> <p>COMPATIBILITY (with everyday operations)</p> <p>COMPLEXITY (the degree of difficulty in understanding the technique)</p> <p>RELATIVE ADVANTAGE (over other techniques)</p>	<p>CHANGE AGENTS -INTERNAL -EXTERNAL</p> <p>THE AMOUNT OF TRAINING</p> <p>LEADERSHIP</p> <p>HELPING RELATIONSHIP THE DEGREE OF PARTICIPATION</p> <p>GROWTH NEEDS (of the QC members)</p>

the leadership factors are the most important pivotal points in organizational change. Likewise Zaltman and Duncan (1977) take a stronger position on the efficacy of the technique as assessed by a number of dimensions shown in Table 3.1.

### The Lack of a Theory on Planned Organizational Change

The other basic problem that has surfaced repeatedly from our experience in applying OD techniques in many fields is the lack of a comprehensive theory of planned organizational change. As Burke (1982) stated so succinctly:

No single theory or conceptual framework is representative or by itself encompasses the conceptual field or the practice of O.D. What we have instead is a group of mini theories that have influenced the thinking and consultative practice of O.D. practitioners. I refer to them as 'mini theories' because each helps to explain only a portion of organizational behavior and effectiveness.

The following sections of this chapter describe a number of such mini theories that have relevance to this research in that they help to provide a theoretical framework for studying QC.

### Likert's Theory of Participative Management

Likert's (1980) Theory of Organizational Effectiveness is depicted in Figure 3.1. He postulated that if causal variables such as leader behavior and organizational climate can be changed then the condition of the intervening variables (e.g., peer behavior and team interaction) will be changed. These in turn will result in the improvement of the end-result variables such as productivity and quality of the products. Unlike the QC which emphasize productivity, Liker's method of OD consists of surveying the organizational processes of a work group and

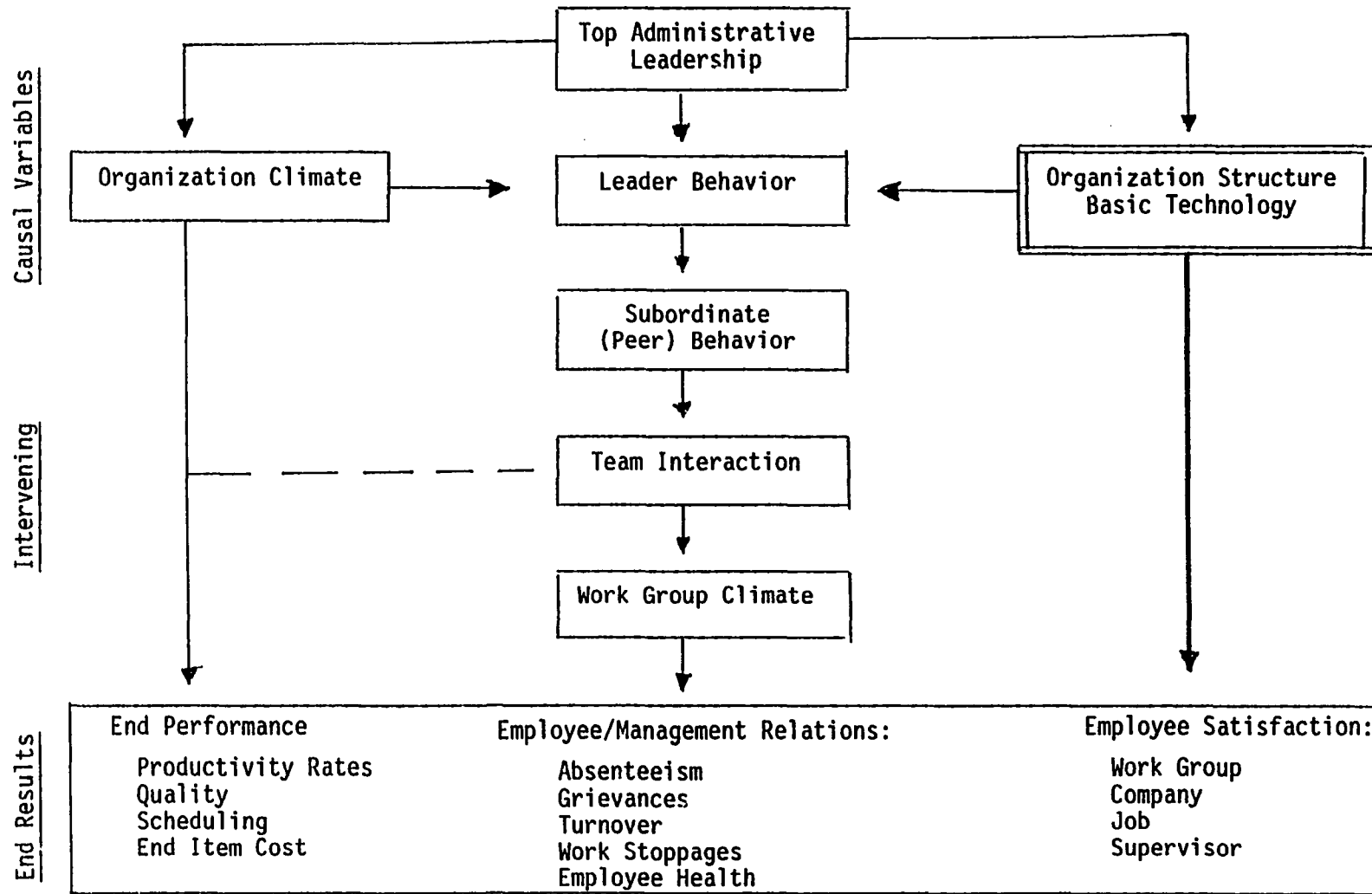


Figure 3.1. A Systems Approach to Organizational Effectiveness

feeding back the results to the same work group which generated that data. Likert also categorizes organizations (or systems in his terms) as one of four types: System 1--Autocratic (top down, exploitative management); System 2--Benevolent Autocracy (still top down but not as exploitative); System 3--Consultative (employees are consulted about problems but the management still makes the final decision); System 4--Participative Management (key policy decisions are made in groups by consensus). The purpose of the survey feedback exercise is to move the organization towards System 4.

When compared with QC the method of survey feedback is a more powerful tool for improving the organizational processes of a work group. However, Likert's assumptions regarding the relationship between the organizational processes and the end result variables were challenged, particularly by the works of Porras (1979). Analyzing thirty-five different research studies, he found that the end-result variables changed before the causal and intervening variables particularly in the case of those OD interventions which are of a relatively short duration (six months or less). This controversy raises an important question with respect to present research. The question is whether the observed improvements in productivity from QC is a result of the improved organizational processes (which constitute the causal and intervening variables according to Likert's theory) or whether they improve productivity in a more direct fashion as suggested by Porras. However, these two mechanisms are not mutually exclusive. Both these conditions may be in operation for one program. For example, the immediate improvement in productivity observed in the short term

may be due to a 'Hawthorne Effect', while Likert's theory may be in operation on the long term.

#### Argyris and Schon--"Single Loop" Learning and "Double Loop Learning

Argyris and Schon (1978) provide a framework for understanding the type of organizational learning that occurs when an organization implements a program such as QC. Organizational learning involves the detection and correction of error. When the error detected and corrected permits the organization to carry on its present policies and adhere to its present objectives, then the error-detection-and-correction process is "single loop" learning. "Double loop learning" occurs when the error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives. Judged according to this perspective, the technical problem-solving that occurs in most hospital QC groups falls into the category of "single loop learning." "Double loop learning," on the other hand, involves a closer examination and modification of the norms, policies and even the planning processes underlying the delivery of medical care services by the hospitals.

#### Hackman and Oldhams' Job Characteristic Model

Hackman and Oldham (1975) identified five core dimensions of a job (viz. skill variety, task identity, task significance, autonomy and feedback) that will help in creating three critical psychological perceptions (viz. experienced meaningfulness, experienced responsibility for the outcomes and the knowledge of the results) within the

employees, with respect to their jobs. The creation of these psychological states (by improving autonomy, feedback, etc.) will, in turn, result in important outcomes such as high internal motivation, high satisfaction and high performance with low absenteeism and turnover. The extent to which this happens depends upon the employee's need for assuming responsibility, challenge, etc., which is determined by the higher order growth needs of the person. The implications of the job characteristics model for QC research are many. The QC may or may not alter any of the five core job dimensions outlined in the model. However by assigning extra responsibility for identifying and solving problems which were, up to now, solved by the management alone, the QC can thus create a situation where the employees perception of autonomy, responsibility and task significance may be enhanced significantly. Therefore, theoretically speaking, the QC should be instrumental in bringing about the same outcomes as specified by the job characteristics model. Similarly, those employees who are relatively high in their growth needs should respond more positively to the QC, i.e., they should be more satisfied and motivated by QC than their counterparts who are relatively low with respect to the same growth needs.

#### Quality of Work Life Interventions

Lawler and Ledford (1981-82) see QC as quality of work life interventions (QWL). According to Carlson (1980), QWL is both a goal and an ongoing process for achieving that goal.

As a goal QWL is the commitment of any organization to work improvement--the creation of more involving satisfying and effective jobs and work environments for people at all levels

of the organization. As a process the QWL calls for efforts to realize this goal, through active involvement of people throughout the organization.

The relationship between QWL interventions such as QCS and the productivity as conceptualized by Lawler is shown in Figure 3.2.

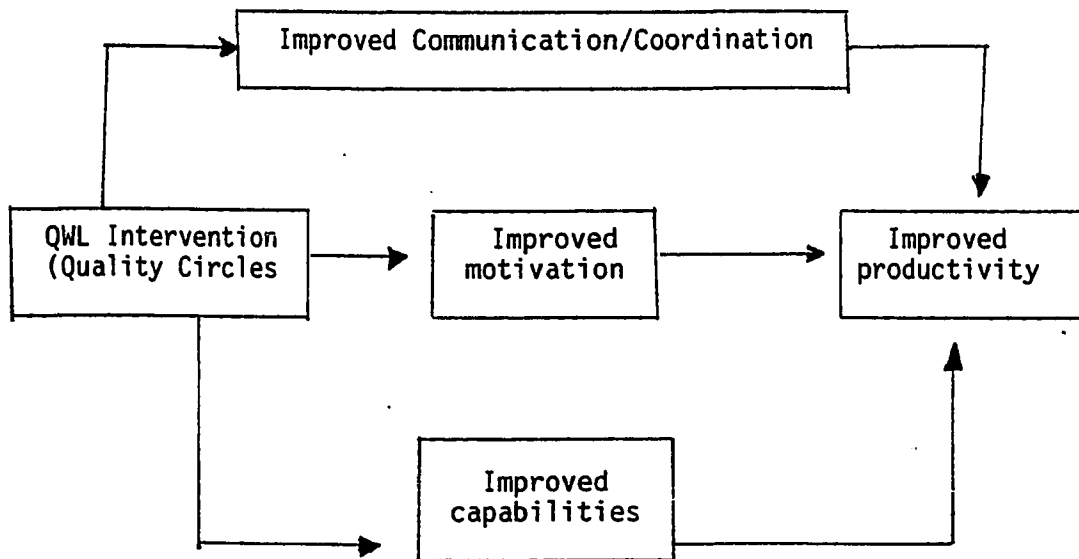


Figure 3.2 Quality Circles and the Quality of Work Life

Source: Edward E. Lawler III and Gerald E. Ledford, Jr.  
1981-82. Productivity and the quality of work life.  
National Productivity Review. 1: 29.

### Organizations as Formal and Informal Systems

French and Bell (1978) see organizations as consisting of both formal systems (the natural work groups) as well as of informal systems. They also use the term 'culture' to define the informal system. French and Bell also define "O.D. as a long range effort

to improve organizations' problem solving and renewal process through a more effective and collaborative management of the organizations' culture." The same authors go further to state

The term 'culture' includes the notion of the informal system by which we mean prevailing patterns of activities, norms, sentiments (including feelings), beliefs, attitudes, values and products. In some ways this informal system is the hidden or suppressed domain of organizational life. Traditionally this hidden domain is not examined. O.D. efforts (must) focus on both the formal and informal systems.

The implication of this concept for QC research is that the informal system of values, attitudes and perceptions of a work group can have a profound influence on the outcomes of a QC intervention. Mapping people's values, attitudes and perceptions is not an easy task. However, many disciplines such as psychology and communication have made use of multidimensional attitude scaling techniques for this process. The study of the informal organizational systems using some of these multidimensional attitude scaling techniques may bring in a totally new perspective to the field of organizational research.

#### Theoretical Framework for QCS

Figure 3.3 presents a theoretical framework to explain the impact of QCS on many organizational variables. Though not exhaustive this model takes into account, as far as possible, the components of the mini theories mentioned thus far. According to this model, the QCS are postulated as having a direct effect upon productivity as well as exerting their impact through causal and intervening variables, in addition the organizational processes as well as the QC program and its outcomes are assumed to be influenced significantly by the informal organizational system.

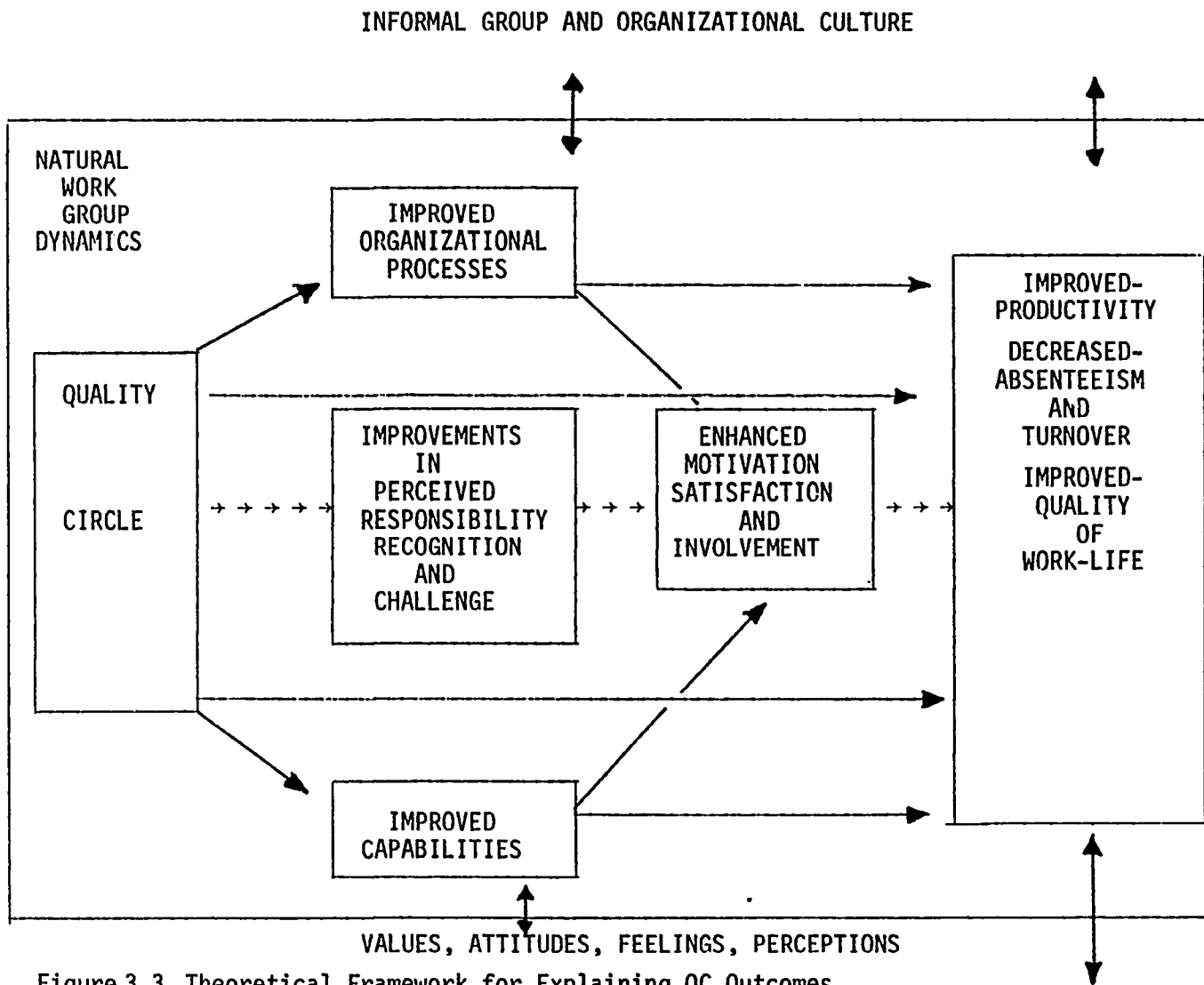


Figure 3.3. Theoretical Framework for Explaining QC Outcomes

### Assumptions Underlying the Current Research

QC have applied QC QCS in business and industry for almost a decade. A review of that experience in the preceding discussions has helped us to arrive at the following assumptions which form the basis of the current research study.

- 1) The reported successes of QCS in business and industry are largely anecdotal.
- 2) There have been very few attempts to use scientific research designs to evaluate the efficacy of the QC programs.
3. There is no established theoretical framework that explains how the QCS affect the various organizational outcomes and the end results such as productivity.
- 4) The QCS that are being applied in the hospital industry are an exact replica of those in business and manufacturing industries. However, the complex and varied nature of the medical care industry makes it necessary that the QC technique should undergo certain modifications and adaptations for it to become optimally effective within the health care field.
- 5) All the QC effects that have been studied thus far fall within the realm of the 'formal organizational system'. The manner in which the informal organizational culture with its component attitudes, values, and belief systems influence the QC process and its outcomes are yet to be investigated.
- 6) Many experts believe that the QC improve the employees' perception of the sense of responsibility, challenge and autonomy

associated with their jobs. However, this postulation has never been scientifically investigated. Similarly, it is not known whether those QC members with a higher level of growth need strength (GNS), perceive a comparatively larger enhancement of the above psychological states than their counterparts with relatively lower GNS scores.

### The Research Objectives

Given the above assumptions about the gaps and deficiencies in current QC research, the present study was launched with three primary objectives in view:

- 1) To identify significant factors influencing the outcomes of QC in hospital settings.
- 2) To analyze major differences in the initiation, mode of conduct and outcomes between hospital QC programs and those in business and industry.
- 3) To compare the outcomes of a hospital QC program with those of a Survey Feedback and Team Building exercise in a similar setting.

In addition to these primary objectives the study was also designed to permit:

- 4) the testing of a number of assumptions related to the theoretical model specified in Figure 3.1.

The pursuit of this task was necessarily limited by the fact that only three of the component relationships specified in the model were

tested in this study. The testing of the entire model was considered as beyond the scope of the current research.

### The Research Questions

In order to realize the above objectives a number of research questions were formulated in relation to each objective.

#### Objective I

- 1) What is the impact of values, attitudes and perceptions of the QC members on its process and outcomes?
- 2)a What is the influence of the leadership style on QC effectiveness?
  - b What difference does it make when the work group supervisor does or does not assume leadership within the QC?
  - c What is the impact of shared or rotating leadership on QC effectiveness?
- 3) How does the membership roles and the individual personalities of the QC members affect QC effectiveness?
- 4) How does the perceived top management support affect QC outcomes?
- 5) How does the group process and the group dynamics of QC meetings influence the success or failure of QC?

#### Objective II

In studying the major differences between hospital QC programs and those in business and industry the main questions posed were:

- 1) How do hospital QC programs differ from their business counterparts in terms of the goals and objectives?

- 2) What are the special problems associated with the implementation of QC programs in hospital settings?

### Objective III

In measuring the results of the QC program, questions were formulated in relation to two types of measures that could be used in that process:

- 1)a Do QC bring about significant improvements in the organizational processes?
  - b How do QC compare with another standard OD intervention such as Team Building (TB) in bringing about the changes in the organizational processes?
- 2)a What kinds of productivity indices do hospital administrators use to monitor QC results?
  - b To what extent do hospital QC improve productivity (as measured by the above indicators)?

### Objective IV

In relation to this objective, questions were formulated to test only three of the relationships among the variables specified in the theoretical model.

- 1) Is there a relationship between the changes in the organizational processes and the improvements in productivity?
- 2)a In comparison to the natural work group do QC provide an added sense of Responsibility, Recognition, Warmth, Motivation, and Satisfaction?

- b Do those QC members with a higher level of Growth Need Strength (GNS) perceive a comparably larger enhancement of the above five psychological states, than their counterparts with relatively lower GNS scores?

### The Study Hypotheses

The study was designed to test six hypotheses relevant to the specific research context.

#### Hypotheses related to Work Group Effectiveness

After a period of 7-8 months

- 1) Those work groups implementing QC will experience a significant improvement in the organizational processes.
- 2) The work group implementing Team Building (TB) will experience a significant improvement in the organizational processes.
- 3) The work group implementing Team Building will experience a significantly higher improvement in the organizational processes than the work groups implementing the QC.
- 4) Those work groups implementing QC will experience a significant improvement in productivity.

#### Hypotheses Related to the Effects of QC on Individual Members

After a period of 7-8 months

- 5) In comparison to the natural work group, the QC will be perceived as providing a significantly higher level of Responsibility, Recognition, Warmth, Motivation and Satisfaction.

- 6) Those QC members with a higher level of Growth Need Strength (GNS) will derive significantly more Responsibility, Recognition, Warmth, Motivation and Satisfaction from the QC than their counterparts with relatively lower GNS scores.

Hypotheses 1, 2, 3 and 4 pertain to the third research objective and the fifth and sixth hypotheses refer to the fourth objective. Because of the highly exploratory nature of the first two objectives and the paucity of information in this area, no hypotheses were formulated in relation to these two objectives.

#### Overview of the Research Methodology

Data for the present study were provided by two QC groups in one hospital and a Team Building (TB) group in another. No control groups or access to information from other departments not participating in the two (QC and TB) interventions were available at the beginning of the study. There were 16 and 9 members each in the two QC groups and 12 members in the TB group. These conditions underlying the study made it unsuitable for any extensive investigations involving the collection of empirical data. Therefore a decision was made to carry out an in-depth study of these three groups using participant observation as the main instrument for data collection. Accordingly, the researcher participated in all QC and TB group meetings and recorded the critical events, interactions and group dynamics using a structured format. In the description of these interactions and group dynamics, the three groups are treated more or less as separate case studies. However, comparisons are drawn, wherever possible, to indicate the common trends. In order to maintain objectivity many of the

conversations and descriptions of the critical events are recorded almost "verbatim." However, the decision as to select what to observe and the interpretation of these events still remain subjective. To enhance validity, many of the interpretations are further substantiated with empirical data from a survey instrument (The Survey of Work Groups) and the results of a multi-dimensional attitude scaling test. The empirical data collected this way are also used in the verification of the six hypotheses stated before.

#### The Limitations of the Study

This study was undertaken in the midst of a number of severe constraints. In addition to the small number of subjects in the study and the lack of control groups, there were many staffing and scheduling problems in the departments implementing the QC and TB interventions. These problems are described in detail in Chapter V. Some of these problems imposed constraints on the collection of empirical data to a considerable degree. These constraints are not uncommon in most organizational settings. However in the present situation they were even made more severe by the fact that the study was conducted in two institutions dealing with "life and death" rather than with some industrial products coming out at the end of an assembly line.

Therefore, it was clear in the design and the implementation of the study that all the research questions cannot be fully addressed within the limits of the current research. Yet, the paucity of research data on hospital QC made it necessary that the present study be as exploratory as it can be. Therefore, it was decided to retain all the research questions stated above and collect as much information

as possible in relation to a larger number of issues rather than to investigate one of them in detail. As such, many of the questions remain only partially answered even at the conclusion of this phase of the study.

### The Significance of the Study

Even with the limitations and the constraints stated above the contributions of this study assume a significant importance in many respects.

First, the study makes a concerted effort to generate urgently needed information in relation to hospital QC programs using a variety of instruments. It is probably the first of its kind to make an attempt to measure QC results objectively in a hospital setting and to compare it with another standard OD intervention.

Second, the study assumes a strong methodological bias by setting out to refine an instrument (The Survey of Work Groups) that is useful for the systematic investigation of QC phenomena in hospitals and outside. The Galileo System of Multidimensional Scaling is being applied in the fields of Health Care and OD for the first time. It provides a reliable instrument for investigating the informal organizational system in a more objective way.

Third, the study also contributes to theory building by testing a number of assumptions related to QC (and larger) OD theory.

## CHAPTER IV

### THE RESEARCH METHODOLOGY

This chapter deals with the research design, the instruments and the statistical analysis employed by the study. As Webb, Campbell, Schwartz and Sechrest (1966) stated: "It is the convergency in the consistency and direction of findings yielded by a combined series of different measures, each with its idiosyncratic weaknesses, which leads to the most fertile search for validity." Thus, convergent validity--the extent to which different measurement instruments that are designed to measure the same thing do indeed produce similar results--is a primary concern in this study.

To enhance validity, the study combines a number of methods of data collection using three different instruments. First, it uses a form of participant observation (called Structured Naturalistic Observation) as a major instrument in data collection. Using this instrument it studies the informal organizational system of a number of hospital work units in their natural setting. Secondly, the study also uses a Multi-Dimensional Attitude scaling technique (called Galileo). This scaling technique makes use of the ideas and concepts of the workers themselves to study and describe the QC phenomena. The process of identifying these ideas and concepts for the Galileo study also improves the employee's level of participation by involving them in designing the research. Third, the subjective interpretation of the observed critical events and interactions are further cross

validated using the results of a more objective survey instrument (called Survey of Work Groups) designed by the researcher himself.

### THE RESEARCH DESIGN

Two hospitals located in Honolulu, Hawaii participated in this study. The first, designated Hospital-A, is a Health Maintenance Organization. It has a membership of 130,000 and a 168 bed medical center. The other hospital (designated Hospital-B), is a 160 bed, for profit, acute care hospital.

#### The Subjects and the Interventions

The intervention in Hospital-A consisted of two Quality Circle groups: one in the Material Department and the other in the Bio-Medical Department. Throughout the rest of this dissertation these two QC will be designated QC 1 (Material Department) and QC 2 (Bio-Medical Department). The membership in QC 1 and 2 totalled 14 and 8 respectively. The intervention in Hospital-B consisted of a combination of Survey Feedback and Team Building sessions. (For the sake of brevity this group will be designated as the Team Building [TB] group.) The members of the TB group were 12 nurse coordinators or nursing supervisors. All three groups met for approximately one hour per week for a period of eight to nine months. Figure 4.1 illustrates the research design for this study. The details of the QC and TB interventions are described fully in Chapter V.

The researcher gained access to these two hospitals with the agreement of evaluating these two OD interventions without any additional commitment of resources. Therefore, the chances of procuring control

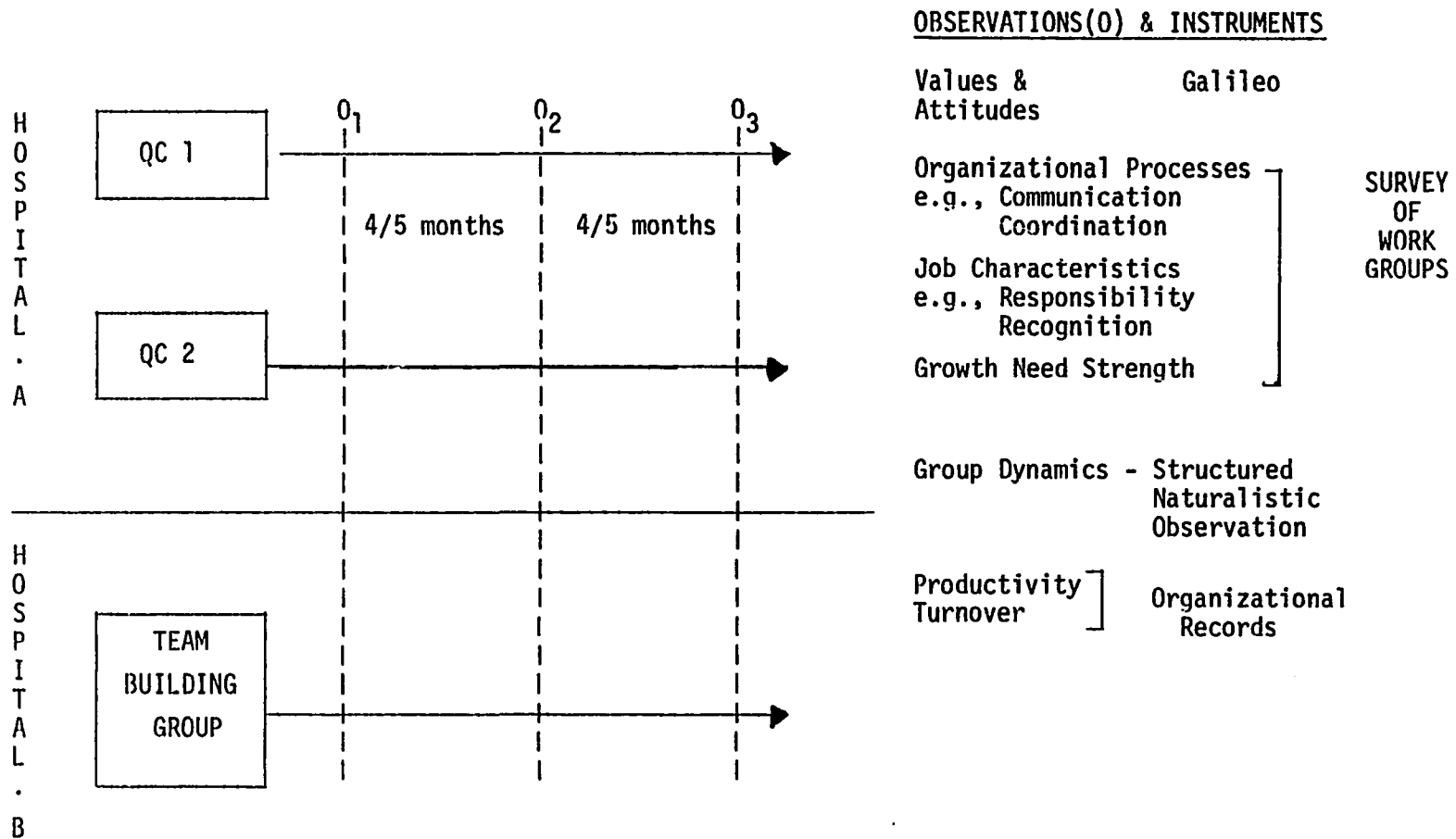


Figure 4.1. Research Design and Instruments

groups or adding other interventions at these research sites were minimal at the beginning of the research project. In addition, the entire membership of these departments was involved in these interventions. Given these circumstances, there was no way to obtain another control group from the same department. When one moves over to other departments for this purpose, the division of labor and the hierarchies within hospitals make such control groups less comparable and meaningful. Because of the wide dissimilarities in the nature of the work performed by them, the results of these groups are presented as three separate case studies. However, comparisons have been drawn among them, wherever possible, to indicate the common trends.

#### The Measurements

In each of the three groups organizational processes and outcomes were measured on three occasions using the Survey of Work Groups (SWG) questionnaire which will be described later. The first measurement was taken at the beginning of the research and the same measurements were repeated approximately four and eight months later. The rationale for repeated measurements was that such measures would indicate trends in the changing pattern of organizational variables more accurately, thus approaching the time series designs specified by Campbell and Stanley (1966). However, a full scale time series design was not possible in this situation due to the time limitations involved in making such repetitive measurements.

In addition to the above, the values, attitudes and perceptions of the members of all three groups were measured using the Galileo System of Multidimensional Scaling (Galileo). Productivity was also

measured in QC 1, using organizational records. Productivity data were not readily available for the other two groups (QC 2 and TB group). The following paragraphs of this chapter will describe the instruments used in taking the above measurements along with a discussion of the issues related to their validity and reliability.

## INSTRUMENTATION

### Structured Naturalistic Observation (SNO)

Most of today's scientific and objective methods of data collection in social science research are based upon a paradigm which assumes recurrence and regularity of social events. Therefore, to measure these events it is necessary to use methods of data collection that are quantitative, replicable and interpretable by others, i.e., the data must be subjected to the tests for reliability and validity. This paradigm has been criticized for sacrificing novelty, imagination and the ability to provide new interpretations to old events, in favor of repeatability and quality control of the measurement process. Recently a new paradigm has come to the forefront to meet these criticisms (Nadler et al., 1983). This new paradigm assumes that history never repeats itself exactly. Much of the recurrence and regularity that is reported in social science arise from using fixed methods and ideas that prevent the perception of novelty and the provision of innovative interpretations to familiar facts. To perceive reality more accurately, it is necessary to observe and measure events as they occur, without being limited by the traditional boundaries of pre-constructed instruments. Structured Naturalistic Observation

(SNO) developed by Nadler, et al. (1983), is a comprehensive approach to the assessment of organizational change which incorporates this new paradigm.

The fundamental "trade-off" in any observational method such as SNO is one of validity and reliability of data as opposed to flexibility, adoptiveness and the possibility for innovative insight. The authors of the SNO method claim that the structuring of the observational process in SNO enhances the validity and reliability of the instrument while, at the same time, retaining most of its unique advantages of flexibility and innovativeness. The authors advocate structuring both the process and the content of observation. The observational process can be structured in terms of the events, the times and the persons around whom the observations are made. In structuring the content of the observation a distinction must be made among the following: (1) specific activities and observable behaviors, (2) subjective interpretations, and (3) the observer's feelings and emotions.

The other specific problem of the observational method relate to coding, identification and retrieval of the observational data. If the data are to be used for analytic purposes, there must be a mechanism by which that data can be retrieved and related to variables in some conceptual framework. The SNO also provides an observational format in which the behaviors (actions), interpretations and feelings can be recorded separately together with a list of variables related to these observations.

At its most basic level SNO consists of the observation of the chronological events and circumstances that prove to be useful in the interpretation of quantitative information and in the choice of analytic themes. However, the observation process can be intensified to include the following activities:

- 1) the observation of recurrent meetings that may identify issues for further exploration;
- 2) observation of key scheduled organizational events of direct relevance to research;
- 3) observation of the events of intervention;
- 4) unstructured and semistructured interviews with key participants.
- 5) structured job observation;
- 6) combined interview-questionnaire formats together with the observational process.

The observational process utilized in the present research included all the above activities with the exception of structured job observation. This process began in a relatively unstructured manner. However, as the research progressed both the content and the process of observation became structured to provide specific answers to the research questions detailed in Chapter III. Throughout the process of observation subjective interpretations and feelings were separated from objective behaviors and actions. Subsequently, these observations were coded in relationship to the number of variables specified by the research questions. Appendix A illustrates the procedure for using SNO format to record the proceedings of one QC meeting.

The list of variables used in the SNO process included leadership, decision-making, perceived influence, communication, coordination, openness of communication and trust and team work. During the period of current research more than 100 QC meetings and TB sessions were observed by the researcher. These meetings and other events such as management presentations yielded a large volume of observational data. Selected excerpts from these records are presented in Chapter V: The criteria for making these selections included: the centrality of the observed event for the purpose of this study and the relevance of the data to the research questions and the hypotheses.

#### The Rationale for Using SNO in Organizational Research

The current research uses SNO as one of the principal methods of data collection. The rationale for using such a qualitative method as a major choice for data collection, is provided by D. T. Campbell (1979). He had been a strong proponent of quantitative methods of data collection and believed that qualitative methods such as participant observation or case studies have no place in scientific research. In self-contradiction of his earlier position (1966), he later stated:

Under this epistemology I advocate one should attempt to systematically tap all the qualitative, common-sense program critiques and evaluations that have been generated among program staff, program clients and their families and community observers. While quantitative procedures such as questionnaires and rating scales will often be introduced at this stage for reasons of convenience in summarizing, non quantitative methods of collection and compiling should also be considered such as hierarchically organized discussion groups. When such evaluations are contrary to the quantitative results, the quantitative results should be regarded as suspect until the reasons for the discrepancy are well understood. (Campbell, 1979)

The combination of the qualitative and quantitative techniques permits research investigations to overcome the inherent weaknesses and the tensions present in both systems of evaluation. For example, the SNO method has as its particular strength the ability to describe events in vivid detail enabling the reader to experience the event almost "first hand," i.e., it conveys the dynamics of the situation with some realness. These descriptive details of the process may even suggest other applications and extrapolations of the same program not thought of by its original planners. This makes the technique particularly useful during the initial exploratory stages of a program. On the other hand, the idiographic focus and the inductive logic of the SNO method do not match the penchant of administrators to generalize results based upon nomothetic research knowledge and deductive logic. A fundamental question related to this study is, "Could QC lead to predictable positive outcomes in other hospital situations?" Such predictions typically rest upon the notion of statistical generalizability which plays a central role in nomothetic research modes and in addition, have special political credibility among many policy-makers. Therefore the addition of quantitative methods of data collection may furnish a source of inspiration to stimulate administrators and OD practitioners to experiment with the further application of QC in other settings. The following methods of data collection, used in this study, conform to the above requirement.

GALILEO SYSTEM OF MULTI DIMENSIONAL SCALING (GALILEO)

Galileo has been described by those who developed it as:

a complete system of research methods including interview methods, questionnaires and a computer program designed particularly to measure beliefs, attitudes and thought patterns. (Woefel, 1977)

This multi-dimensional scaling procedure has two distinct advantages over other unidimensional attitude scaling methods such as Likert or Thurstone scaling. First, as Woefel (1977) claims, the accuracy of the Galileo system is infinitely greater than the traditional categorical types of attitude scales. For example, the five point Likert scale formally limits the respondent to anything more than 20 percent accuracy. Galileo does not have this formal limit since it does not use these limiting categories. Secondly, unlike the unidimensional scaling procedures, the multi-dimensional scaling techniques such as Galileo have the power to simultaneously represent various influence of a number of values, attitudes and perceptions, that relate to a particular topic. This is done by plotting the concepts in a single spacial map (technically referred to as the projection of the structure) (Barnett, Serota & Tylor, 1976). In fact, the same authors maintain that "attitude" can only be defined in relationship to other cognitive elements in an attitude structure. They describe "attitude" as"

the set of interrelationships which define any cognitive element's proximity to all other cognitive elements. That is, the attribution of value to any element will be done on the basis of what other elements are associated with it and the evaluations placed upon these elements.

In short what the Galileo technique does here is to adopt the comparative measurement rule of Descartes. Einstein (1961) summarized this rule when he stated:

For the purpose of measurement of a distance we require another distance (Rod-S), which is to be used once and for all, and which we employ as a standard measure. If now, A and B are two points on a rigid body, we can construct the line joining them according to the rules of Geometry: then starting from A, we can mark off the distance S, time after time, until we reach B. The number of these operations required is the numerical measure of the distance AB.

In the Galileo system, rather than designating a rod or a stick as the standard measure, the distance (proximity, discrepancy or separation--these words may be used interchangeably) between two psychological objects (or ideas) is arbitrarily designated as the standard measure. The subjects are then requested to judge the distance or separation between all other ideas as ratios of this arbitrary standard separation (Woefel, 1974). Thus, the separation between two fairly stable concepts is designated as a criterion and this separation is ascribed a value such as 10 units or 100 units (the number being one which is culturally plausible). Then, the separation between each pair of concepts is judged in comparison to this standard.

The Galileo system uses an "emic" approach to define the attitudinal structure of a group. Instead of using the concepts and values of an outsider (such as an academic researcher) the Galileo system makes use of the indigenous or "emic" concepts, defined by the subjects themselves, to study their attitudinal structure. Therefore, the first step in the Galileo study was to perform a number of in-depth interviews with the QC members to identify the concepts or ideas they associated with the QC phenomenon. From these interviews a list of most frequently

mentioned concepts were developed. This list included as many as thirty ideas. However, only the first eight of the most frequently mentioned ideas were made use of, in the present Galileo study. These included: (1) The work unit (or the Department), (2) Management, (3) Team work, (4) Participation in decision-making, (5) Providing a sense of involvement, (6) Trusting others, (7) Being open to change, (8) The organization (Hospital). Three other concepts were appended to this list: (9) me, (10) my supervisor, and (11) The Quality Circle. The next task was to designate the distance between two of three concepts as the criterion pair. The concepts "Me" and "The Hospital" were selected as the criterion pair because of the relative stability of these concepts. The distance between "Me" and "The Hospital" was then assigned a standard distance of 200 units. All eleven concepts were then paired in all possible combinations. The subjects (the employees) were next requested to judge the distance (or proximity) between all other pairs of concepts (listed in a Galileo questionnaire) in reference to the criterion (or the standard) distance of 200 units between the Hospital and the Employee. The Galileo questionnaire is illustrated in Appendix B. In this questionnaire the term "far apart" is defined as meaning a measurement of distance or proximity among psychological objects (or concepts).

The Galileo computer program averages the values for each pair of concepts across all the members of a group (the QC or TB group). The average distance matrix generated in this way is then transformed into a scalar product matrix. The Galileo program also performs a principal component analysis on the scalar product matrix to identify

a number of coordinates (also referred to as orthogonal vectors of dimensions).

The computer program can then plot the concepts along these vectors radiating from a central point known as the centroid of the plot. This plot generates a spatial map of the attitudinal structure of the group under investigation. The attitude structure of the group is best represented by a multidimensional spatial model. In this study the output of the Galileo program will specify all the coordinates or the dimensions of the attitude structure of each group. However, for the purpose of simplicity, only two of the first three dimensions will be plotted in the Galileo maps presented in Chapter V.

Barnet et al. (1976) found that when the concept "Myself" or "Me" was included among other Galileo concepts in the research study it appeared to have special properties vis-à-vis behavior. For example, they discovered that the political candidate nearest to the Ego (Me) concept received the largest share of votes in a congressional election. This characteristic has been found in other studies as well. For example, the market products closer to the Ego were found to have greater sales than those that were distant from it (Green and Carmone, 1972). Another study noted that the distance between the graduate faculty and graduate students was found to be predictive of the communication frequency among them (Jones and Young, 1972). Woefel (1977) also found that the concepts nearer to Ego were rated most favorable by the subjects. This evidence indicates that the relationship between Ego and a particular concept has some predictive power relating to behavior. Therefore the Ego (Me) concept was included among other

concepts identified by the preliminary interviews. Similarly, the supervisor plays a critical role in the natural work group and in many QC as its leader. For the purposes of this study it was important to ascertain the reactions of the group to the supervisor in the role of leader of the natural work group and as a member or leader of the QC group. As such the concepts "Supervisor" and "The Quality Circle" were also added to the list of concepts generated by the interviews.

#### RELIABILITY OF GALILEO

Reliability is commonly accepted as being inversely proportional to the difficulty of the judgment task (Stuart, 1982). As a consequence, the measure for any given individual in a Galileo study may be unreliable. As Woefel (1974) indicates:

the technique of direct paired distance estimates requires a highly complex set of judgements from the respondent, while providing virtually no structure and is consequently unreliable for the measurement of individual psychological contents (or differences).

However, since the stated goal of Galileo is to measure collective social and cultural conceptions of a group, the aggregation techniques used in that process improve the accuracy of measurement (Serota et al. 1975). By applying the Central Limits theorem and the Law of Large Numbers (Barnett, Serota and Tylor, 1976), it was found that the arithmetic average of all responses in any cell in the matrix will converge on the true mean of the population. Test-retest reliability coefficients in the range of .85-.90 have been reported for measuring group attitudes with Galileo (Barnett, 1972; Danes and Woefel, 1975). Hence, the reliability coefficients are not worked out again for the

purpose of this study. However, the results of the Galileo study have to be interpreted with caution in light of the smaller numbers of subjects involved in this study.

#### THE SURVEY OF WORK GROUPS QUESTIONNAIRE (SWG)

The SWG questionnaire, shown in Appendix C, has four sections. Section A deals with demographic variables such as age, sex, education, salary range and the length of employment within the hospital and the present department. Section B measures the organizational processes and outcomes. This section contains 33 Likert type items which includes six subscales (1-6). The first subscale is a "dummy" scale that contains a number of miscellaneous items such as the number of meetings held over the past month, the availability of standard operating procedures (SOP), and other factors. Most of these miscellaneous items were not used in the present study. However, subscale-1 contains two variables important for the present study. They are Decision-Making and Role Clarity which are measured as single items in questions (Q) 14 and 20.

Subscale-2 measures the employee's perception of Influence within the work setting (Q.10). This is calculated as the average score of influence over (i) setting up goals and objectives of the work unit, (ii) deciding on the operating procedures, (iii) setting the pace of one's own work, and (iv) the freedom to handle exceptions to the rules and procedures.

Subscale-3 measures the level of motivation as the average score of (i) the amount of effort put into work, (ii) the amount of energy

devoted to improving one's own performance at work, and (iii) the sense of accomplishment derived from a job well done (Q.10).

Subscale-4 measures Communication and Coordination. Coordination was originally measured as the average score of Coordination within and outside the unit (Q.18 a and b). Similarly, Communication was measured as the average score of these seven items: (i) Communication upwards and downwards (Q.15 and 14), (ii) face to face (or telephone discussions) within and outside the work unit (Q. 17 a and b), (iii) written communications within and outside the unit (Q.16 a and b), and (iv) openness and honesty of communication. However, some of these items were deleted later during the process of item analysis.

Subscale-5 measures Job-satisfaction as the average score of the level of satisfaction with (i) the job as a whole, (ii) the pay, (iii) the supervisor, (iv) the co-workers, (v) the opportunities for promotion within the job, (vi) the level of responsibility offered by the job, and (vii) the degree of challenge involved in the job (Q.24 a-g).

Subscale-6 measures Leadership as the average score of (i) the leader's knowledge of what it takes to be a good leader (Q.26), (ii) his/her administrative skills (Q.27), (iii) his/her attitude toward encouraging participation (Q.28).

All the items in this section were adapted and synthesized from standard organizational surveys and assessments developed by Likert (1980), Van de Ven and Perry (1982) and Hackman and Oldham (1980). Although the original sources of these items were standard instruments known for their high internal consistency, reliability and discriminant validity, it does not mean that the items borrowed from these instruments will possess the same properties especially when they are applied

in a different research setting. As a result, all the items in this section had to be retested for internal consistency and reliability. In the present study this task was accomplished by using Veldman's Testat computer program (Dunn-Rankin, 1983). The Testat program calculates the mean, standard deviation and the Pearson  $r$  correlation of each item with its subscale as well as the entire instrument. This correlation acts as a discrimination index for each item: i.e., if an item correlates highly with the subscale score and the total score, it is internally consistent and should be retained. On the other hand, items are eliminated from the instrument on the basis of poor internal consistency (low correlation), very high or low endorsement (i.e., very high or low mean), and poor variability (low standard deviations). The Testat program also calculates the Cronbach's Alpha reliability coefficient for each subscale and the main instrument. In interpreting Cronbach's Alpha, the general rule is "reliabilities in excess of .60 are generally retained (Bagozzi, 1978). Therefore reliability levels over .60 are regarded as acceptable for this study.

In determining the internal consistency and the reliability of the items in this section, the first step was to run the Testat program with all 33 items and six subscales. The output of the Testat program for this analysis is shown in Tables 4.1 and 4.2. Table 4.1 shows the Cronbach's Alpha values for the six subscales and the entire instrument containing all 33 items. It can be seen here that (a) the overall reliability of the entire instrument (Alpha for scale 7) is very high (.8695) and (b) the subscale-3 (motivation) has a very low reliability level (.1695). Table 4.2 shows the results of item analysis for all 33 items. It can be seen here that item number 1, which is a

Table 4.1

Means, Standard Deviations and Cronbach's Alpha  
Values for the Six Subscales and the  
Entire SWG Instrument

<u>Scale No.</u>	<u>Scale Name</u>	<u>No. of Items</u>	<u>Means</u>	<u>Sigmas</u>	<u>Alphas</u>
1	MISCELLANEOUS	7	2.5714	3.58	.6075
2	INFLUENCE	4	24.714	2.61	.7964
3	MOTIVATION	3	12.8571	1.73	.1695
4	COMMUNICATION AND COORDINATION	9	29.8571	3.36	.4586
5	JOB SATISFACTION	7	26.0000	3.98	.8716
6	LEADERSHIP	3	11.0714	1.98	.7568
7	WHOLE INSTRUMENT	33	115.9286	12.41	.8695

Table 4.2  
Item Analysis With All Thirty-Three Items  
of the SWG Instrument

Item No.	Variable	Scale	Mean	Sigma	R(Total)	R(Scale)
1	MOTIVATION-1	3	3.93	1.28	.0167	.7714
2	DECISION-MAKING	1	3.64	1.29	.4498	.7260
3	INFLUENCE-1	2	3.72	.88	.2987	.8166
4	INFLUENCE-2	2	3.21	.94	.5710	.8819
5	INFLUENCE-3	2	3.50	.73	.6880	.7850
6	INFLUENCE-4	2	4.14	.74	.5283	.6582
7	MOTIVATION-2	3	4.79	.41	.3055	.7636
8	MOTIVATION-3	3	4.14	.92	.5105	.4653
9	COMMUNICATION-DOWN	4	3.14	.92	.4224	.3091
10	COMMUNICATION-UP	4	2.93	.59	-.0977	.0665
11	MEMOS-WITHIN	4	3.14	.83	.3810	.5183
12	MEMOS-OUTSIDE	4	3.21	1.01	.1058	.6815
13	I-P COMMUNICATION-1	4	4.57	.82	.4879	.8076
14	I-P COMMUNICATION-2	4	4.14	.99	.3613	.7157
15	COORDINATION-WITHIN	4	3.21	.77	.5975	.2873
16	COORDINATION-OUTSIDE	4	2.79	.77	-.0463	-.1495
17	RED TAPE	1	3.36	.72	.7324	.7266
18	GOAL CLARITY	1	3.14	.92	.6678	.6731
19	ROLE CLARITY	1	2.86	.52	.4788	.4316
20	ROLE CONFUSION	1	2.64	.97	.5784	.7569
21	S.O.PS	1	3.50	.73	.1061	-.3271
22	JOB SATISFACTION-1	5	3.57	.62	.5783	.8066
23	JOB SATISFACTION-2	5	4.00	.76	.7765	.7831
24	JOB SATISFACTION-3	5	3.86	.74	.7741	.7974
25	JOB SATISFACTION-4	5	3.14	.52	.5602	.4876
26	JOB SATISFACTION-5	5	3.57	.90	.6151	.7743
27	JOB SATISFACTION-6	5	3.93	.80	.6336	.7851
28	JOB SATISFACTION-7	5	3.93	.88	.6965	.8121
29	LEADERSHIP-1	6	3.71	.70	.4910	.7876
30	LEADERSHIP-2	6	3.93	.70	.7029	.8751
31	LEADERSHIP-3	6	3.43	.98	.3668	.8311
32	OPEN COMMUNICATION	4	2.71	.96	.3105	.4537
33	MEETINGS	1	2.43	1.18	.3978	.6702

part of subscale-3, has a very low correlation with the total score ( $R(\text{total}) = .0267$ ). In addition, three other items, items (10), (16) and the availability of Standard Operating Procedures (item 21) also show very low correlations with the total score. Based upon these results, subscale-3 and items 10, 16 and 21 were deleted from the instrument.

Tables 4.3 and 4.4 show the Cronbach's Alpha values and the results of the item analysis after the above items were deleted from the instrument. Table 4.3 indicates that (a) the overall reliability of the instrument has improved up to .8951, (b) the reliability level of subscale-4 has improved from .4586 to .6464, and (c) the reliability levels of all other subscales register values over .70. The results of the analysis in Table 4.4 indicate that the reliability levels of all the other items in subscale-1 and 4 have improved, after deleting the above inconsistent items.

In addition to the above items that were deleted from this section, information related to two other variables (written and interpersonal communication) were not utilized in the present analysis. It was realized that more sophisticated techniques such as network analysis were needed to study this aspect of organizational communications adequately. Also during the data analysis, Openness and Honesty of Communication (referred to hereafter as Open Communication) was coded separately from the rest of the Communication variables (referred to hereafter as Communication). This was done to highlight the crucial importance of honesty and trust in communications for the success of the QC and the TB exercise.

Table 4.3

Means, Standard Deviations and Cronbach's Alpha Values  
After the Deletion of Subscale 3 and Items 10, 16 and 21  
from the SWG Instrument

<u>Scale No.</u>	<u>Scale Name</u>	<u>No. of Items</u>	<u>Means</u>	<u>Sigmas</u>	<u>Alphas</u>
1	MISCELLANEOUS	6	18.0714	3.88	.7534
2	INFLUENCE	4	14.5714	2.61	.7964
4	COMMUNICATION AND COORDINATION	7	24.1429	3.58	.6464
5	JOB SATISFACTION	7	26.0000	3.98	.8716
6	LEADERSHIP	3	11.0714	1.98	.7568
7	WHOLE INSTRUMENT	27	93.8571	12.05	.8951

Table 4.4

Item Analysis after the Deletion of Subscale-3  
and Items 10, 16 and 21 from the SWG Instrument

Item No.	Variable	Scale	Mean	Sigma	R(Total)	R(Scale)
1	DECISION-MAKING	1	3.64	1.29	.4434	.7768
2	INFLUENCE-1	2	3.71	.89	.2318	.8168
3	INFLUENCE-2	2	3.21	.94	.4761	.8819
4	INFLUENCE-3	2	3.50	.73	.7291	.7850
5	INFLUENCE-4	2	4.14	.74	.5135	.6582
6	COMMUNICATION: DOWN	4	3.14	.92	.4815	.4515
7	MEMOS-WITHIN	4	3.24	.83	.3223	.3761
8	MEMOS-OUTSIDE	4	3.21	1.01	.1840	.6412
9	I-P COMMUNICATION-1	4	4.57	.82	.4851	.7739
10	I-P COMMUNICATION-2	4	4.14	.99	.3672	.7798
11	COORDINATION-WITHIN	4	3.21	.77	.6326	.3760
12	RED TAPE	1	3.36	.72	.7328	.7086
13	GOAL CLARITY	1	3.14	.92	.7149	.6610
14	ROLE CLARITY	1	2.86	.52	.4917	.3981
15	ROLE CONFUSION	1	2.64	.97	.6182	.7834
16	JOB SATISFACTION-1	5	3.57	.62	.6774	.8066
17	JOB SATISFACTION-2	5	4.00	.76	.7922	.7831
18	JOB SATISFACTION-3	5	3.86	.74	.7725	.7974
19	JOB SATISFACTION-4	5	3.14	.52	.5443	.4876
20	JOB SATISFACTION-5	5	3.57	.90	.6703	.7743
21	JOB SATISFACTION-6	5	3.93	.80	.7191	.7861
22	JOB SATISFACTION-7	5	3.93	.88	.7440	.8121
23	LEADERSHIP-1	6	3.71	.70	.5713	.7876
24	LEADERSHIP-2	6	3.93	.70	.7405	.8751
25	LEADERSHIP-3	6	3.43	.98	.3261	.8311
26	OPEN COMMUNICATION	4	2.71	.96	.3491	.5320
27	MEETINGS	1	2.43	1.178	.3768	.6806

To summarize, after ensuring the adequacy of internal consistency, eight process variables were measured using section-B of the SWG. They were (1) Decision-making, (2) Role Clarity, (3) Downward Communication, (4) Coordination, (5) Openness and Honesty of Communication, (6) Job Satisfaction, (7) Leadership and (8) Influence.

Section-C of the SWG measures the higher order Growth Need (GNS) of the employees who are members of the QC or the TB group. The GNS scale was originally developed by Hackman and Oldham (1980) in two forms: a "would like" format and a "forced choice" format. The authors agree that the forced choice format is superior because it elicits less socially desirable responses from the respondent. Van de Ven and Perry (1982) adapted the force choice format of the GNS scale as part of their Organizational Assessment Instrument (OAI). The present research uses the format of the GNS scale published as a part of OAI items which force the respondent to select between one of two situations listed there. These twelve choices include:

- 1) prefer creativity over pay (Q.34)
- 2) prefer pleasant people over important decisions (Q.35)
- 3) prefer loyalty over responsibility (Q.36)
- 4) prefer no discretion over financial trouble (Q.37)
- 5) prefer unfriendly workers over routine job (Q.38)
- 6) prefer no skill job over critical supervisor (Q.39)
- 7) prefer learning over supervisor respect (Q.40)
- 8) prefer no challenge over chances of layoff (Q.41)
- 9) prefer fringe benefits over job skill development (Q.42)
- 10) prefer poor work conditions over little freedom (Q.43)

11) prefer personal skill use over team work (Q.44)

12) prefer isolated job over no challenge (Q.45)

The scores for questions 35, 36, 37, 39, 42, and 43 are reversed (by subtracting the score from 6). The scores for the twelve items are then totalled to obtain the GNS score. Since the midpoint of the five-point scale is 3, an individual who remains neutral (or circles 3) for all items would have scored 36. Therefore an index was created with all the employees with GNS less than 36 having an index of 1 and those having a GNS level greater than or equal to 36, had an index of 2. This procedure yielded two categories of employees with high and low GNS levels (having an index of 1 or 2) for comparison purposes in Chapter VI.

Section-D of the SWG has five items which compare the natural work group with the QC (or the TB group) with respect to five attributes on a scale of 1 to 10. These attributes included (1) Responsibility, (2) Recognition, (3) Warmth and Support, (4) Motivation, (5) Satisfaction (with the work group or QC).

#### MEASUREMENT OF PRODUCTIVITY, ABSENTEEISM AND TURNOVER

As stated earlier, productivity can be measured in terms of (1) The quantity (or the Rate) of production, (2) the quality (or Accuracy) of production, (3) the cost of production. Organizational records were used to ascertain this information with respect to the above indices. The problems with the use of organizational records for the purpose of calculating productivity are well documented (Zahra, 1982). It was found that the QC 1 (in Hospital-A) had maintained fairly accurate records of several short-term indicators pertaining to the

Rate and Accuracy of production. However, no comparable records could be obtained from QC 2 or the TB group (in Hospital-B) to study their productivity. Information relating to absenteeism and turnover rates were available for all three groups.

#### STATISTICAL ANALYSIS

The changes that occurred in the organizational processes of the three groups over time was compared using the MANOVA procedure of the SPSS-X program. The same procedure was used to compare the two groups with high and low GNS levels on the five characteristics measured in section-D of SWG. The Student t-test was used to compare the QC (or TB) with the natural work group, on the five characteristics measured in section-D of the SWG. The same procedure was employed to compare the employees with high GNS score with those who had lower scores.

CHAPTER V  
FINDINGS--RESEARCH OBJECTIVES I AND II

This chapter describes the salient features of group dynamics and inter-personal relationships demonstrated by the two QC and the Team Building (TB) group. The major source of information for this chapter was derived from records maintained by the researcher as a part of the Structured Naturalistic Observation (SNO) method. As mentioned previously, the process of observation was kept relatively unstructured at the beginning of the study. However, as the research progressed, it became increasingly structured for the purpose of providing answers to the questions listed under the first two research objectives in Chapter III. As indicated earlier, the variables that received the most emphasis in the process of SNO were those related to the functions of membership and leadership. In addition, the values and attitudes of the group and the special problems associated with implementing QC in hospital settings, are also described in this chapter.

THE QC PROGRAM IN HOSPITAL-A

The planning process for the QC program in Hospital-A began in May, 1982. The program was coordinated by the hospital's Director of Organizational Effectiveness Services. He had several years experience in implementing Organizational Development (OD) programs in hospital settings. In the planning phase a steering committee was appointed to oversee the entire QC program. The members of the steering committee included the Director of Organizational Effectiveness

Services and a number of top administrators of the hospital. During this stage a training program was conducted to train QC leaders and facilitators. The training procedures followed the guidelines of the Quality Circle Institute (Dewer, 1980). Once the initial planning phase was completed, a decision was made by the steering committee to establish two QC in the hospital's Bio-medical and Material departments.

#### Quality Circle (QC)=1

The QC in the Material department began during the first week of November, 1982, with the Material supervisor as its leader. The fourteen members (six females and eight males) who participated in the circle represented four different work areas--the warehouse, print shop, the front desk and the data processing Section. This circle was facilitated by a trained facilitator--a middle manager from another department of the same hospital. The Director of Organizational Effectiveness Services attended most of the QC meetings for the first six months of the research period. The first four meetings of the circle were assigned for training its members, which were carried out according to the guidelines. The researcher was admitted to the QC from its fourth meeting. The group decided that he should participate in all matters pertaining to the circle, similar to the other members of the group. The researcher's participation in the circle fluctuated along a continuum of passive observation to active facilitation. Therefore the group was facilitated at different times by three individuals--the regular facilitator, the Organizational Effectiveness Services Director or the Researcher. This continuous attention

and control combined with the charismatic leadership of the QC leader (the supervisor), was responsible for creating a situation of excessive dependence within the group. This development is discussed in greater detail in the following paragraphs.)

In the area of problem solving this QC was credited with many achievements. Using the Brain-Storming technique, the group identified more than 50 problems pertaining to its work area. Following this, they prioritized these problems and selected three problems for further analysis and resolution within the circle. These problems concerned the poor working conditions in and around the warehouse:

- 1) Inadequate lighting in the mezzanine area of the warehouse
- 2) Poor ventilation in the mezzanine area, and
- 3) The presence of paint and lacquer fumes in the warehouse.

The mezzanine area of the warehouse serves as storage for the hospital's vast volume of medical records. Since so many records had accumulated over the years, the storage boxes had reached almost a ceiling high level. The shadows cast by these tall stacks had rendered the overhead lighting virtually useless. These stacks also prevent the cross-ventilation of the mezzanine area creating an extremely hot and uncomfortable work environment, particularly during the summer months. Under these circumstances, it was found that the rate of retrieving old medical records from the mezzanine area had dropped considerably during the summer quarters of the two previous years (see Figure 6.9). After analyzing the problem in great detail and considering possible alternative solutions, the circle implemented two very simple solutions. The first solution was to build a supporting

structure (to hold the boxes) and remove a number of boxes of records to create window-like areas through which cross ventilation could occur readily. The second solution was to provide each warehouse worker with a 'miner's type' flashlight attached to a head band. This solution was considered to be more efficient and far less costly than installing additional light fixtures on the roof or carrying a mobile light in the hand. Another advantage was that the light could be adjusted to focus directly upon the boxes that were being searched while leaving both hands free. After these two interventions were implemented the temperature in the mezzanine area dropped as much as five degrees Fahrenheit. Following the steps, the summer quarter of 1983 did not show such a decrease in processing medical records as compared to the previous years (see Figure 6.9).

The solutions to the problems of poor lighting and ventilation could be easily implemented with the resources available to the circle itself. However, the problem of paint and lacquer fumes in the warehouse necessitated a solution which was outside the limits of the resources, power and authority of the QC. Therefore the group agreed to make a management presentation to solicit support for the proposed solution.

#### The Management Presentation

The management presentation was made before the hospital's Regional Manager, the President of the Medical Group and the Material Manager. The members of the QC took turns in presenting the problems they identified, the alternatives they considered and the final solutions they reached. They sought help and approval from top management

to repair the existing roof of the warehouse as well as to install a large exhaust fan to eliminate the paint and lacquer fumes.

Replying on behalf of the management the president of the Medical Group stated he was "amazed and impressed with the amount of enthusiasm shown and the extent of work that had gone into the process of arriving at these solutions to three important problems relating to the work area." After the management presentation was completed, the group began to work on the problem of "picking errors." The details of this problem and its solution are described later in Chapter VI.

#### The Group Dynamics and Interpersonal Relationships of QC 1

Despite the high level of enthusiasm generated during the management presentation, QC 1 retained a number of group process problems. The state of this group throughout the research period could best be described as "excessive dependence aggravated by over facilitation and over control." The most characteristic feature of this group was its overly directive leadership by its supervisor. He was a very dynamic and charismatic individual who assumed personal responsibility for most QC activities which included member training, scheduling meetings, secretarial work and overseeing that the proposed solutions were implemented. The sense of structure and direction that he provided was very useful particularly at the early stages of group development within the QC. Unfortunately, he was not willing to relinquish any of these responsibilities or to train other members to assume leadership for some of the activities that he was carrying out. This situation created a sense of dependency within the group, upon its leader for most of its functions. As stated previously, this state

of affairs was further aggravated by the presence of three other facilitators within the group. The group's sense of excessive dependency was most evident during a three week period when the supervisor experienced a brief illness and was absent from QC meetings. The group staggered and floundered during this period and accomplished very little. There was a show of relief when he returned to the group. One member said: "Thank God that K. is here to put things back into the normal gear." On another occasion the QC was given a group exercise by the Director of Organizational Effectiveness Services. The purpose of the exercise was to compare the effectiveness of individual decision-making to that of group decision-making. The supervisor did not participate in this exercise. Again the group demonstrated a lack of direction, structure or leadership throughout the period of the exercise. Consequently, the final results of the group scores were far worse than the individual scores.

The Galileo map for QC 1, shown in Figure 5.1, also indicates the group's dependence to some extent. It can be seen that the concept "Me" is fairly close to other concepts such as "The Supervisor," "QC," "Work Unit," "Trust," "Team Work," and "Involvement." This signifies that the QC members identify themselves as being close to their supervisor, the QC and the work unit. They also associate QC with team work, trust and involvement. However, the two concepts that remain fairly distant from this cluster of concepts are "Participation in Decision-making" and "Being Open to Change." This indicates the members' minimal perception of their influence to initiate change or participate in important decisions affecting the work group and QC.

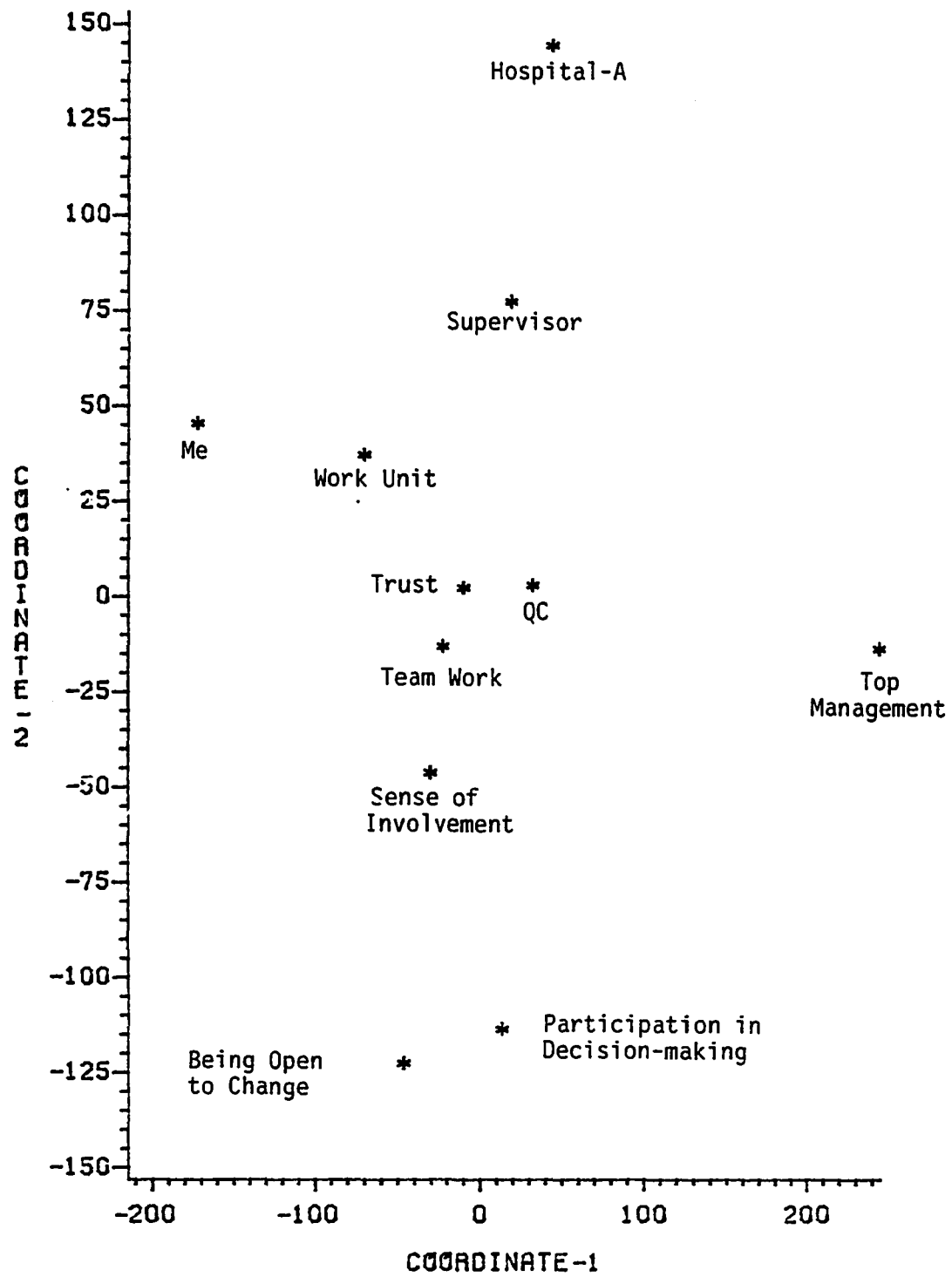


Figure 5.1. Galileo Plot-QC1

This explanation is further substantiated by the following excerpts from comments made by some of the QC members:

"Dealing with managerial decisions is good but [we] cannot effectively deal with the real issues when the supervisor is a part of the same group."

"My expectation is that we would get into more 'meatier' issues but, I know that we wouldn't dare approach them for the fear of retaliation from the management."

It is also interesting to note that this same group had fairly low scores on "Perceived Influence with the Survey of Work Groups Instrument.

To summarize, the interactions of QC 1 were dominated by its charismatic leader and the over direction and facilitation provided by three outside experts. The structure and direction provided by these individuals helped the group to accomplish its goals as well as to receive praise and commendation from top management. However, it left the group with a sense of excessive dependence. Team work and group involvement seem to be somewhat superficial since the members felt that their level of participation and the group's openness for change were inadequate.

### Quality Circle-2

The QC in the Bio-Medical Department started three weeks later than QC 1 (December 1982). There were eight members in the group-- three females and five males, who were from the same department. For some unknown reasons, the formal supervisor of the Bio-medical department was not selected for QC leader training. Therefore, two middle managers from other departments of the same institution were chosen as the QC leader and the facilitator. Since its inception, the

researcher was present for all the QC meetings (thus increasing the membership of the group to eleven). After six meetings the QC leader departed from the group for personal reasons, leaving the QC without a formal leader. At that point the group decided to rotate both the leadership function and the secretarial activities among its membership.

The group identified a list of more than 30 problems as affecting their work unit. Out of this list the circle focused its attention, first, upon the "lack of Standard Operating Procedure (SOP)." The Joint Commission on Accreditation of Hospitals (JCAH) has cited the lack of SOP as a major deficiency within the department during one of their previous inspections. For example, availability of SOP related to preventive maintenance of emergency equipment is an important requirement for JCAH accreditation. After several months of diligent work, the group developed a SOP manual which focused upon the following areas:

- 1) Filling out work orders
- 2) Filling out non-stock requisitions
- 3) Using inter-departmental requisitions for ordering
- 4) Processing work orders
- 5) Preventive maintenance guidelines
- 6) Preventive maintenance procedures
- 7) X-ray service calls
- 8) Other service calls
- 9) Repairs within the Bio-medical department
- 10) Maintenance log
- 12) Film processor preventive maintenance guide
- 13) Travel procedures

Before each SOP was finalized, at least three or four drafts were made. The management presentation in this group took a different form than that of QC 1. Instead of inviting the top management personnel, the QC decided to invite the middle managers whom they interacted closely with. The management presentation was a new learning experience for the QC as well as the managers who attended. These managers were very impressed with the new SOP. Most of them commented that these new procedures would straighten out a number of problems related to their transactions with the Bio-medical department. They were also surprised to learn that the development of this SOP manual was completed during the course of the work group's normal daily activities.

In contrast to QC 1, the interactions of QC 2 can best be described as "counterdependence." Bennis (1964) defines counterdependence as "a state of being discomfited by authoritative structures." The leadership style of the Bio-medical shop supervisor (who was not the QC leader in this instance) seemed to be 'autocratic'. He decided unilaterally 'what', 'when' and 'how' things should be done in the department and dictated these decisions along a one way communication system. Within the department it was not customary to hold staff meetings which denied the employees the opportunity of providing input into decisions affecting their work life. As a result, there was a high level of dissatisfaction, frustration and turnover within the department. The turnover rate within the group for the past two years was 50 percent. The reasons given by the employees who left the department were: Frustration, dissatisfaction, the inability to use one's skills to the fullest extent and the lack of opportunities for

career development. Interestingly, many of these frustrations between the group and its formal supervisor carried over into the QC meetings. In fact, the group utilized the QC to serve as a platform to confront the autocratic leadership of its supervisor. In one instance, the work group was dissatisfied with the supervisor's manner of assigning its members to perform Bio-medical repairs in clinics outside of Honolulu. The members made use of one-half of a QC meeting to question and confront the supervisor regarding the criteria adopted by him in assigning staff to do repairs in the clinics. The rotation of leadership reduced the powers of the supervisor to that of an ordinary member of the QC. It gave the members increased confidence to confront the supervisor in a manner in which they would not have been able to do outside of the QC. Many of the problems described by the group during the problem identification stage also had some bearing on the supervisor's leadership style. These problems were as follows:

- 1) The lack of clarity with respect to job descriptions and the assignment of responsibilities.
- 2) Lack of "follow-up" on problems
- 3) Lack of coverage for work in the absence of the supervisor
- 4) Unclear goals and objectives within the department were stemming, at least partly, from the behavior of the supervisor. The reason for the group's decision to work on SOP was partially due to the belief that it would reduce the supervisor's opportunities to act in a dictatorial manner.

In addition to confronting the supervisor on his leadership style, the group also demanded that he assume responsibility for an equal share of the QC's work. The group then assigned the supervisor the task of formulating SOP in a number of areas. They also decided on a deadline for him to submit the drafts to the group, similar to the other members. After a few months it became evident that the supervisor was intimidated by the members' retaliation directed towards him and the additional work imposed by the QC. His attendance in meetings and the completion of QC assignments became increasingly erratic. Finally, about two weeks prior to the management presentation when the SOP assigned to him were incomplete, the group members threatened him with the prohibition of his participation in the presentation. The following note was sent to him by the leader of the QC:

If you do not submit your SOP either in person or through me at the next meeting, the remaining QC members will undertake the task of writing the SOP that you are responsible for, and will present them at the management presentation. You will not be allowed to present them at the presentation nor will you be given credit for them. You will, however, be allowed to attend the management presentation.

After the receipt of this note the supervisor completed the SOP on time and presented them at the management presentation. After the management presentation the supervisor's relationship with the QC group further deteriorated. The group unanimously decided to oust him from the group. This was done fairly tactfully. The facilitator of the QC presented him with the option of not participating regularly in the meetings but rather serve in a consultant's capacity when his services were regarded as essential for the problem under consideration.

Having no other alternative to consider, the supervisor accepted this decision.

The Galileo map for QC 2 is shown in Figure 5.2. The concepts "Me," "QC," "Work Unit," "Sense of Involvement," "Being Open to Change" and "Team Work" remain fairly close together in one cluster, which indicates that the group members identify themselves with these concepts. The most striking feature is the distance between the concept "Supervisor" from the cluster of concepts described above. The large distance between "Me" and "The Supervisor" is indicative of the members' disapproval of his leadership style. The distance between "The Supervisor" and the rest of the concepts in the cluster demonstrates the group's feeling of dissociation of the supervisor from the 'participative ethic' implied in these concepts. Similarly, the large distance between "The Supervisor" and "Trust" shows the group's lack of trust with the supervisor.

To summarize, the members of the Bio-medical department were suppressed by and dissatisfied with the autocratic leadership style of their supervisor. The QC meetings afforded them the opportunity, the confidence and a forum to confront his behavior. They became more independent and cohesive during the process, the supervisor gradually distanced himself from the group. Though not measured in quantitative terms, the task accomplished by the group during this period can have far-reaching consequences for the entire organization.

#### The Team Building Group

The Team Building (TB) group in Hospital-B consisted of ten nurse coordinators (nursing supervisors), their Nursing Director and The

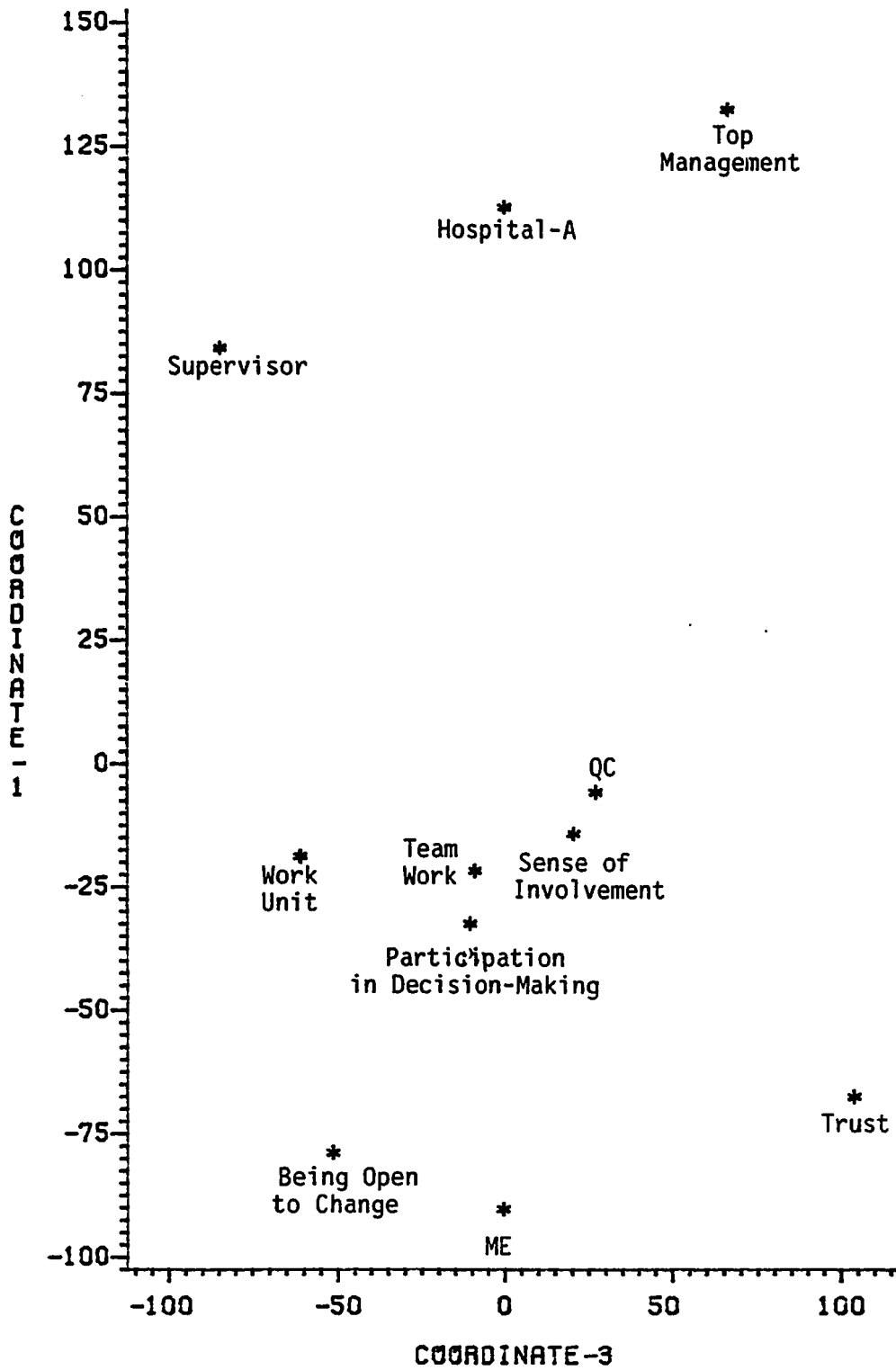


Figure 5.2. Galileo Plot - QC2

Associate Administrator of Hospital Services (AHS). Aside from being an all-female group, the main difference between the TB group and the two QC was that the intervention in this group was not pre-planned as in the case of the two QC. During the early phase of the program, the researcher collected a large amount of data related to the working relationships of the TB group. This was done with the help of a number of interviews and with the aid of the Survey of Work Groups (SWG) instrument. These data were then communicated to the group with the use of the Survey Feedback technique. The main purpose of this exercise was to arrive at a mutually agreeable "diagnosis." The main problems uncovered and mutually agreed upon during this phase were: (1) lack of trust, (2) lack of cohesiveness and team spirit, (3) feelings of alienation and subgrouping, (4) role confusion, (5) lack of openness and clarity with respect to communications. The following comments made by the group members in response to the SWG questionnaire bear ample evidence for this situation.

"There is difficulty between members to communicate openly."

"Value conflicts and individual differences get in the way of team work and day-to-day operations."

"There is a lot of interpersonal conflict. We have a big split in the philosophy and attitudes between critical care coordinators and medical and surgical coordinators."

"Sometimes information is given out selectively."

"Commitment to individual concerns override the group objectives."

"Communications are not open--some never express an opinion within the group but do so outside."

"Lack of freedom for open disclosure of genuine thoughts and feelings without the fear of judgments being placed upon the individual."

"Territorial thinking and hidden agendas."

"Lines of responsibility and authority need clarity."

The results of the SWG questionnaire also indicated low scores on perceived influence, role clarity and openness and honesty of communication.

Given this organizational diagnosis, it was mutually agreed upon by the researcher and the group that QC was not the most appropriate intervention in this situation. After a lengthy discussion and debate, the group agreed upon a Team Building intervention which included the following activities:

- 1) Using open discussion groups for further exploration of the issues cited above--the process being facilitated by the researcher.
- 2) Giving and receiving feedback to each other regarding their technical roles and the interpersonal behavior within and outside the group.
- 3) Providing training for the group members to observe their own group process and to use the results of these observations to analyze the group's modes of decision-making, level of participation and the membership and leadership roles.

As the group discussions continued, several issues related to the problem areas were uncovered. The main event which triggered off the present episode of severe distrust among the members of the group was a proposed restructuring of the organizational chart involving the positions of the nurse coordinators. This plan was designed entirely by the Nursing Director and the Associate Administrator for Hospital Services (AHS). The nurse coordinators had previously heard

rumors of the reorganization plans. However, they were not aware of the nature of that restructuring until the entire plan was presented to them by the Nursing Director and the AHS. The plan involved the following changes: (1) the complete elimination of one coordinator position, (2) reduction of three critical care coordinator positions to one with the possible reassignment of the other two coordinators elsewhere. Many coordinators perceived the proposed changes as endangering their jobs. After explaining the plan to the coordinators, the Nursing Director and AHS asked for their individual input. In response, they all remained silent. As one coordinator stated "I felt kind of threatened and immobilized. When Mrs.-- requested input, I didn't know what to say."

Although the group did not offer any input at the meeting, they immediately made arrangements to have their own private meeting. The Nursing Director, the AHS and another member of the group were excluded from this meeting. (In one of the feedback sessions this member was told by the group, they perceived her as "a spy who would leak the contents of the closed meeting to the Nursing Director and the AHS.") At the closed meeting the group agreed to make representations to the physicians in the hospital, about the inappropriateness of the reorganization plan proposed by the Nursing Director and the AHS. They also decided on their own (alternative) plan for reorganization. This plan was later presented to the Nursing Director and the AHS. After lengthy discussions and negotiations the original plan for restructuring was somewhat compromised. However, this issue was never resolved completely since it continued to surface throughout the TB sessions.

Compounding this problem were feelings of sub-grouping and alienation among many group members. There was also constant friction between the regular day coordinators and the evening and night shift coordinators, who were members of the same group. The level of conflict between these two factions was so great that the two groups could not agree upon a common meeting time. The shift coordinators continued to meet on their own reporting separately to the AHS.

The strategy adopted during the TB sessions was to create an environment in which members could express their past grievances, hurt feelings and misgivings. They were also encouraged to give feedback to each other regarding their behavior within and outside the normal work group. After a slow and painful start, the coordinators described many past and present experiences that contributed towards stress and mistrust within the group. In fact, the entire version of the restructuring incident narrated above was reconstructed from excerpts taken from discussions during TB sessions. The group members also expressed much concern about issues related to their acceptance within the group. For example, as one newcomer to the group stated: "Most of the time I hesitate to talk because I keep wondering whether my contributions are worthwhile or not. At times I don't feel as if I am a full-fledged member of the group." At this point the AHS replied by saying that the new members sometimes have difficulties in being integrated into the group. However, her rationalization was soon disproved of by one of the longest-standing members of the group who declared "I have been in the hospital since its inception, but there are many occasions when they [the group members] make me feel isolated and left out of the group."

As the group grew more cohesive and the members began to trust each other, many deep emotional feelings were expressed with constant regularity. The predominantly negative comments described thus far may give the impression that only negative feelings were expressed in the TB sessions. However, there were many incidents where caring and support were openly expressed. For example, at the end of a TB session, one member stated:

"Right now I am going through a bad divorce. It was very reassuring for me to know that I am not messing things up. The feelings of caring and affection that were expressed here will certainly help to elevate my mood a little bit."

The process of giving and receiving feedback climaxed when some members of the group mentioned to the AHS that there is no way in which they could give feedback about certain aspects of her behavior. Again, it must be pointed out here although the group expressed their true feelings in this situation, they did not intend to do so with any negative connotation. In fact, they commended her for relinquishing her leadership role temporarily and attending TB sessions like the other members. They also praised her style of maternalistic caring for the coordinators particularly when they were distressed by problems related to the work situation. Yet, the nature of her relationship with the rest of the group made it impossible for them to relate to her with any degree of closeness. Despite these positive comments, the AHS became very defensive about the feedback she received and recanted by refusing to attend any further TB sessions. She said, "I have had enough of this group telling me that they are being intimidated by my presence. If they feel intimidated by my behavior why should I attend those meetings any more?" After discussing her

reactions, the group came to the conclusion that it was not the group that was threatened by her presence; rather it was she who was threatened by the nature of events going on in the TB sessions. The group also tried various strategies to bring her back into the group. The group sent an emissary who reiterated the group's intentions and expressed their confidence and acceptance of her as their leader. However, she never returned to the group until the end of the current research.

Figure 5.3 shows the Galileo plot for the TB group. The concepts seem to be fairly scattered without a definite pattern. However, the most striking feature is the distance between the "Work Unit" and "Trust" and "Being Open to Change." The latter two concepts remain far removed from the "Work Unit" which indicates the meager level of trust and the resistance to change within that group. On the other hand, the TB group which consists of the identical membership as the work unit seems to be a little closer to the same two concepts. This may be an indication of at least the partial success of the TB sessions and the movement of the group closer towards building trust and lowering its resistance to change.

To summarize, there was much mistrust, frustration and subgrouping among the coordinators when the TB sessions were started. A previous attempt at restructuring the group--planned and executed unilaterally by the Nursing Director and the AHS--made matters worse. The role negotiations and feedback exchange as a part of the TB exercise helped many members to express and discuss some of these feelings. These self-disclosures and constructive feedback sessions were

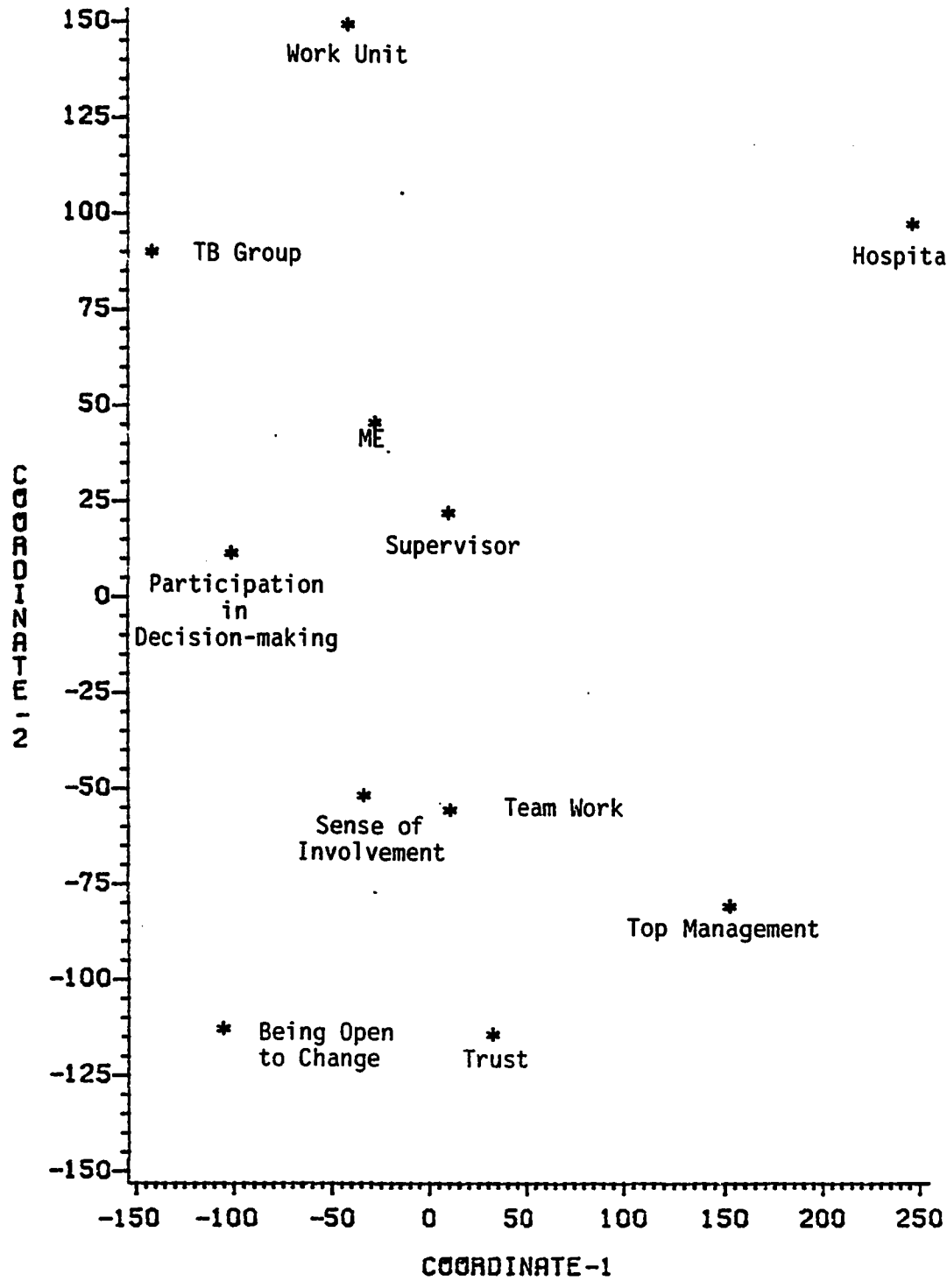


Figure 5.3. Galileo Plot--TB Group.

certainly helpful to the group members who began to trust each other towards the later sessions. However, neither the group nor the leader proceeded completely towards the next important stage of changing their behavior based on the feedback.

#### Special Problems Associated with Hospital OD Programs

Two of the main problems experienced by all three groups were staffing and scheduling. In all three groups, there were occasions when one or more members had to leave the QC (or TB) meetings because of exigencies related to urgent patient care services. The work groups of both QC 1 and QC 2 served many satellite clinics outside Honolulu as well as on other islands in the same state. Consequently, it was not uncommon to find one or two absentees in each QC meeting since members of both QC had to attend to business elsewhere on a fairly regular basis.

The other main problem was measuring QC effectiveness. This problem has already been discussed in Chapter III. However, it is important to note that both QC 2 and the TB group had no way of assessing the impact of the solutions to the problems they identified in any quantifiable manner. For example, it would have been extremely difficult to measure the impact of the SOP manual developed by QC 2 on its work group or the entire organization. In the case of many business organizations, it is fairly easy to measure the Return-On-Investment or the Cost Savings accrued as a result of the QC solutions implemented.

The other main problem related to hospital QC programs stems from the closely interdependent nature of hospital work groups. In the case of QC 1, it was found that the solution of the problem of 'Picking Errors' entailed an action which would require the close cooperation of the department which orders the item; the warehouse which selects and delivers the item; and the housekeeping department which receives it on behalf of the requesting department. Consequently, a QC consisting of a single work group will have only a limited capacity to deal with a problem such as picking errors. Unfortunately, far too many problems faced by hospital work groups have such multiple roots of origin.

CHAPTER VI  
FINDINGS--RESEARCH OBJECTIVES III AND IV

This chapter contains the principal findings relevant to the questions and hypotheses described under research objectives III and IV.

RESEARCH OBJECTIVE III

The first question in relation to this objective was stated as:

- 1)a. Do QC promote significant improvements in the organizational processes of hospital work groups?
- b. How do QC compare with TB in promoting the changes in organizational processes?

To answer these questions the changes in the process variables of the three groups were compared with each other and over time using the MANOVA procedure of the SPSS-X program. The following results refer to the multivariate analysis of variance using a model which specifies the following: (1) the eight process variables as dependent variables, (2) the three groups (two QC and TB) as a between subjects factor, and (3) the two time periods over the three measurements as a within subjects factor. Table 6.1 shows the multivariate and univariate tests of significance for contrasting the three mean values of the variables over time. The insignificant time effects indicate that the process variables have not changed significantly over the period of the research for any one of the three groups. Therefore, the first and the second hypotheses stated below, are rejected:

Table 6.1. Multivariate and Univariate Tests of Significance for Comparing the Process Variables of all Three Groups Over Time

ANALYSIS OF VARIANCE

EFFECT.....TIME

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	.60210	.85117	16.00	9.00	.628
HOTELLINGS	1.51319	.85117	16.00	9.00	.628
WILKS	.39790	.85117	16.00	9.00	.628

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	2.24074	33.27841	2.24074	1.38660	1.61600	.216
ROLE CLARITY	.05556	23.90341	.05556	.99598	.05578	.815
OPEN: COMMUNICN:	.29630	34.02841	.29630	1.41785	.20898	.652
JOB SATISFACTION	.02469	9.06262	.02469	.37761	.06539	.800
COORDINATION	2.24074	13.42187	2.24074	.55924	4.00673	.057
INFLUENCE	1.76042	17.94957	1.76042	.74790	2.35382	.138
COMMUNICATION	.20576	9.61695	.20576	.40071	.51350	.481
LEADERSHIP	1.61317	16.67235	1.61317	.69468	2.32217	.141

Hypothesis 1. Those work groups implementing QC will experience a significant improvement in organizational processes.

Hypothesis 2. The work group implementing TB will experience a significant improvement in organizational processes.

In comparing the process variables of the three groups, the first question to be asked is "How do the three groups compare with each other with respect to the process variables?" Table 6.2 shows the multivariate and univariate tests of significance for comparing the three groups on process variables. The multivariate tests show that the group effects are significant at the .001 level. The univariate F-tests are also significant with the exception of the Leadership and Coordination variables. These Group effects illustrate the presence of significant differences in the group means of these process variables. However, these differences could have arisen from the fact that the group means of the process variables were different from each other from the beginning of the research. In fact (as shown later from Figures 6.1-6.8) this was the case in this study. Therefore, the most interesting finding is not the Group effects but the Group by Time (interaction) effects. This will indicate whether there is any one group which behaves significantly different from the others with respect to the process variables. Table 6.3 shows the results of the multivariate and univariate tests of significance for comparing the Group by Time interaction effects. These significant interaction effects indicate that there is at least one group which behaved

Table 6.2. Multivariate and Univariate Tests of Significance for Comparing the Three Groups of Eight Process Variables

ANALYSIS OF VARIANCE

EFFECT.....GROUP

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	1.59876	8.94012	16.00	36.00	.000
HOTELLINGS	10.32748	10.31748	16.00	36.00	.000
WILKS	.03265	9.63564	16.00	36.00	.000
ROYS	.88714				

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS.</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	26.6692	32.8864	13.3346	1.3703	9.7314	.001
ROLE CLARITY	15.7145	12.4583	7.8573	.5199	15.1364	.000
OPEN: COMMUNICATION	17.3131	12.9091	8.6566	.5379	16.0939	.000
JOB SATISFACTION	13.7919	7.0152	6.8959	.2923	23.5922	.000
COORDINATION	1.8116	11.0464	.9058	.4603	1.9680	.162
INFLUENCE	6.9739	18.6804	3.4870	.7784	4.4799	.022
COMMUNICATION	6.0579	8.2260	3.0289	.3428	8.8373	.001
LEADERSHIP	2.0031	11.1519	1.0015	.4646	2.1554	.138

Table 6.3. Multivariate and Univariate Tests of Significance for Comparing the Group-Time Interaction Effects

ANALYSIS OF VARIANCE

EFFECT.....GROUP BY TIME

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F.</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	1.52723	2.01900	32.00	20.00	.051
HOTELLINGS	8.86437	2.21609	32.00	16.00	.047
WILKS	.04352	2.13400	32.00	18.00	.046

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	6.98085	33.27841	3.49043	1.38660	2.51725	.102
ROLE CLARITY	6.32061	23.02273	3.15530	.95928	3.28924	.055
OPEN COMMUNICATION:	2.76326	18.90341	.88163	.78764	1.11933	.343
JOB SATISFACTION	.03337	9.46200	.01668	.39425	.04232	.959
COORDINATION	1.83738	13.42187	.91869	.55924	1.64274	.214
INFLUENCE	1.94626	17.94957	.97313	.74790	1.20115	.291
COMMUNICATION	1.41465	5.23659	.70732	.21819	3.24177	.057
LEADERSHIP	2.49226	16.67235	1.24613	.69468	1.79381	.188

significantly different from the other two with respect to the changes in the process variables.

The next step in the data analysis is to identify the group(s) that behave differently from each other. Figures 6.1 to 6.8 are line graphs which depict changes in the mean values of the process variables in all three groups for the duration of the current research. The first measurement was made in November 1982, before the research began. The other two measurements refer to the mean values of the same variables four and eight months after the intervention, respectively. Upon examination of these charts one can see a distinct pattern of change in most of them. For example, six out of the eight variables (with the exception of Coordination and Leadership) show a gradual decrease in the case of group 1 (QC1) and a corresponding increase in the case of group 3 (the team building group). In group 2 (QC2), four variables (Job Satisfaction, Decision-making, Influence and Communication) remain more or less static over the duration of the research. Two out of the other four variables in group 2 (Coordination and Leadership) resemble group 1 in that both decrease over time. Similarly, the other two variables gradually increase over time as in the case of group 3. Tables 6.4 to 6.6 show the multivariate and univariate tests of significance for comparing the changes in the process variables of the three groups with one another. These statistics validate the pattern of changes shown in the line graphs. The only two groups that differ significantly from each other are groups 1 and 3 (Table 4.6). On the other hand, the differences between groups 1 and 2, and 2 and 3 are insignificant (Tables 6.5 and 6.6).

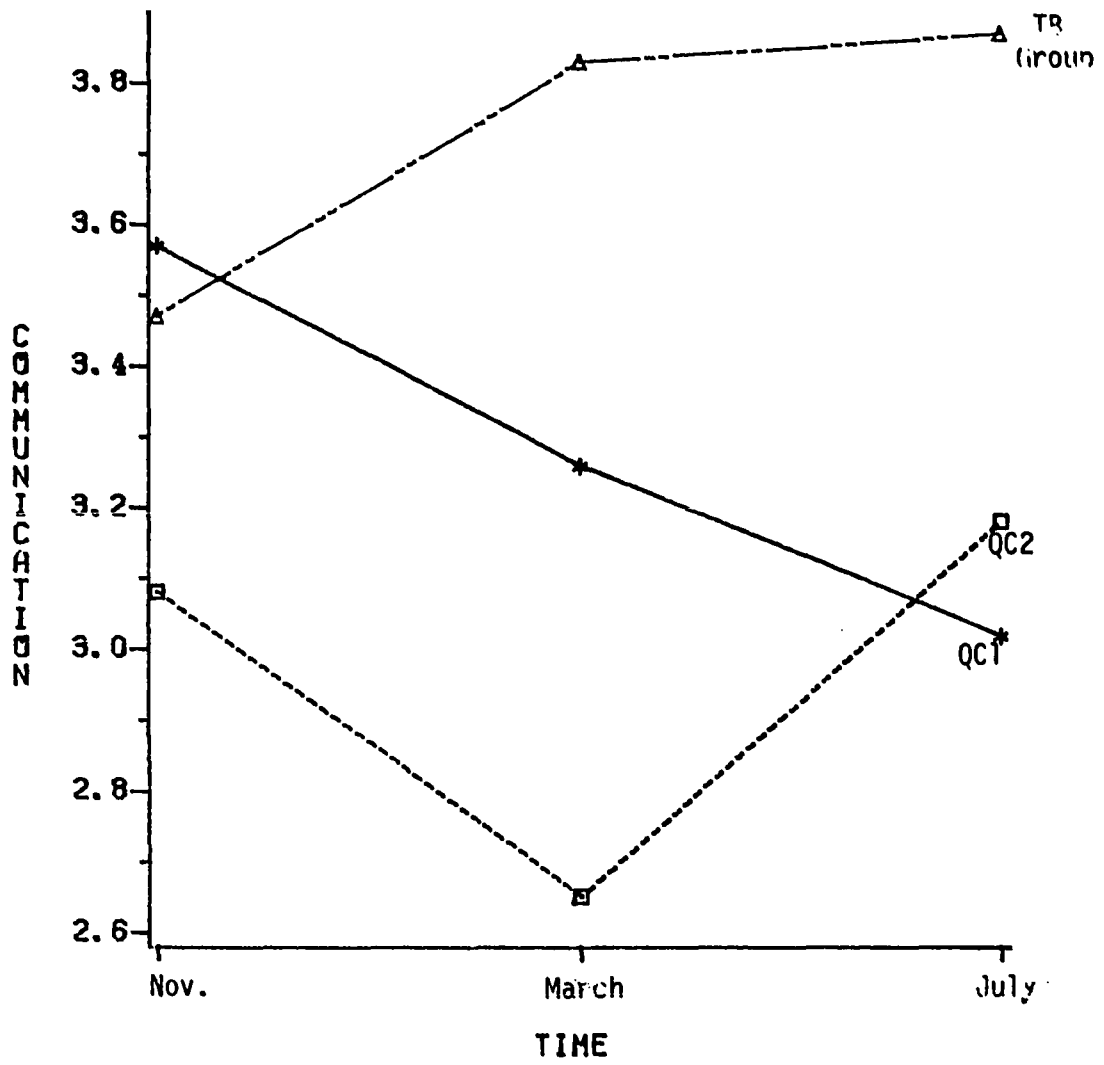


Figure 6.1. Changes in Communication.

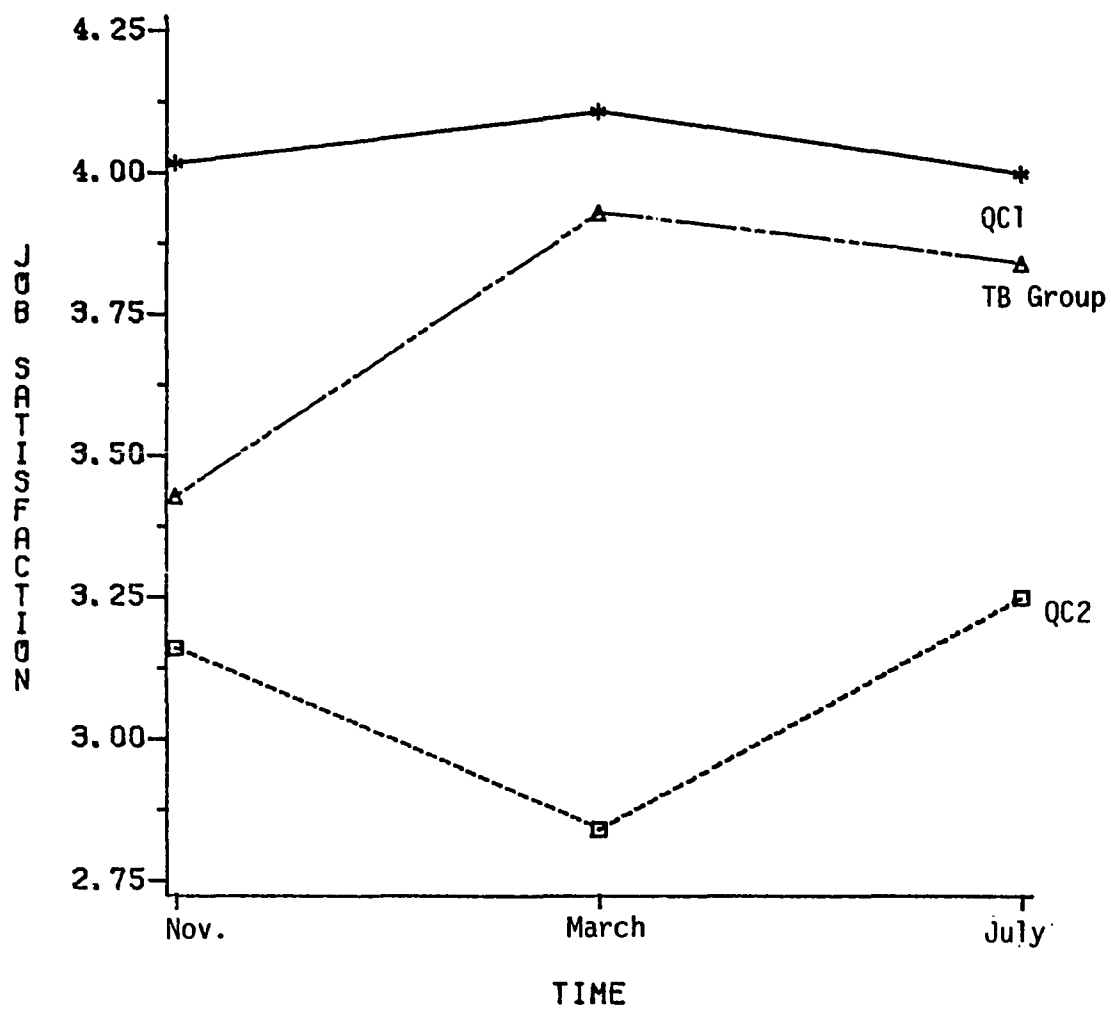


Figure 6.2. Changes in Job Satisfaction.

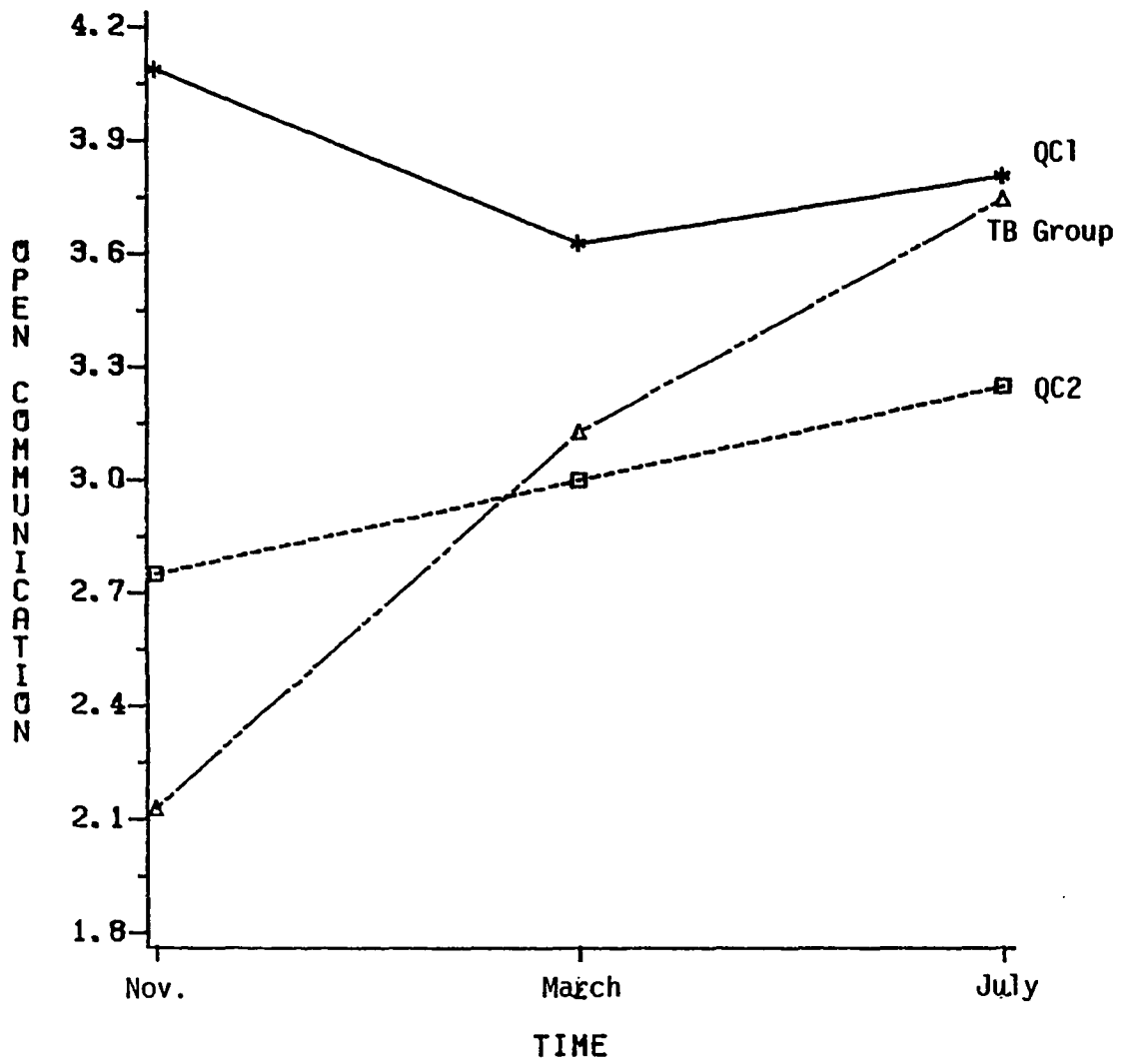


Figure 6.3. Changes in Openness of Communication.

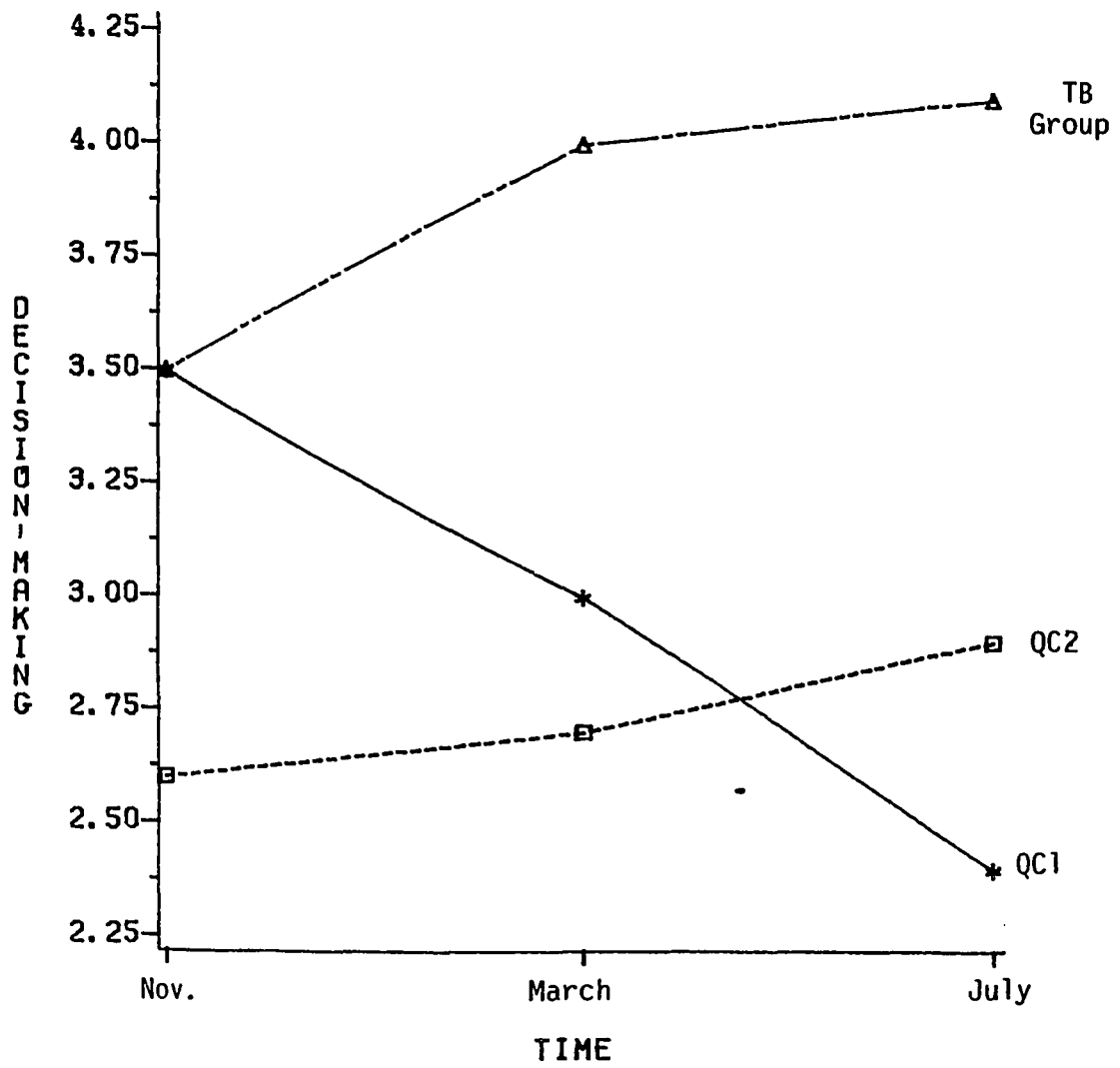


Figure 6.4. Changes in Decision-Making.

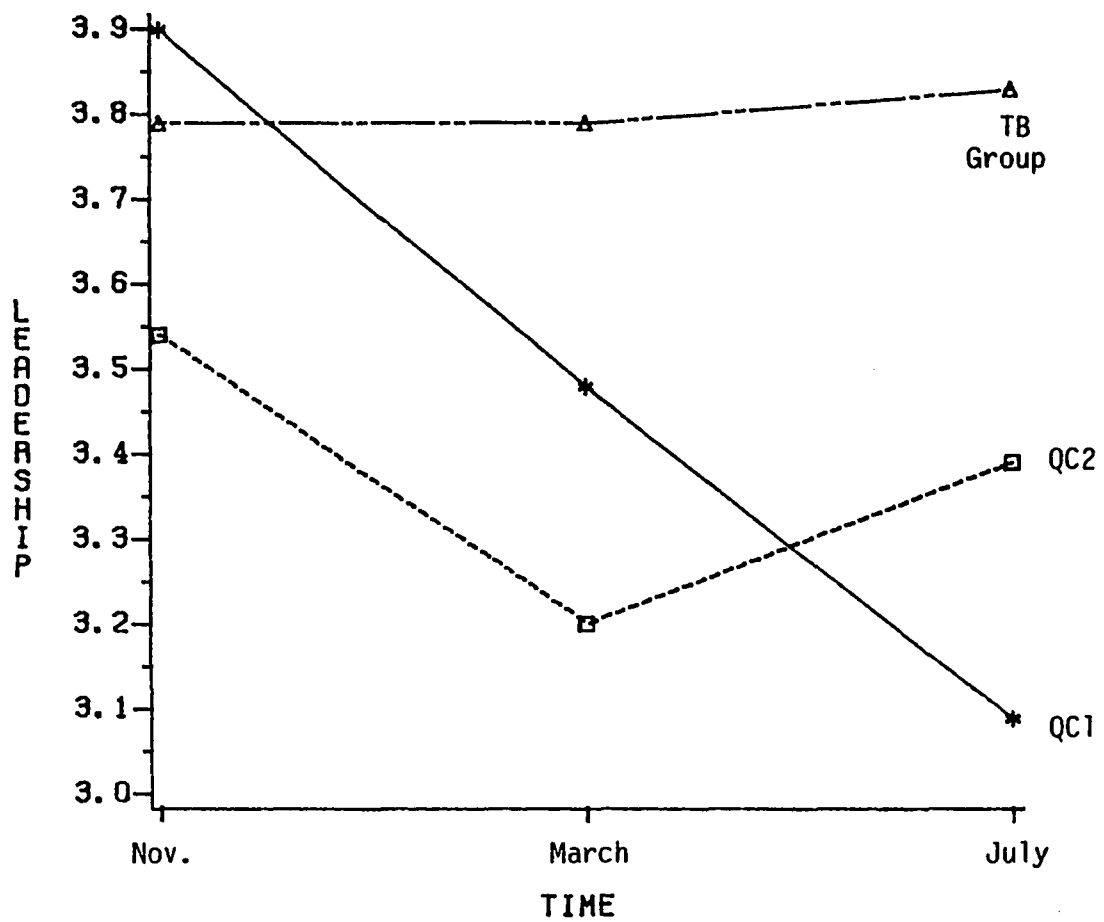


Figure 6.5. Changes in Leadership.

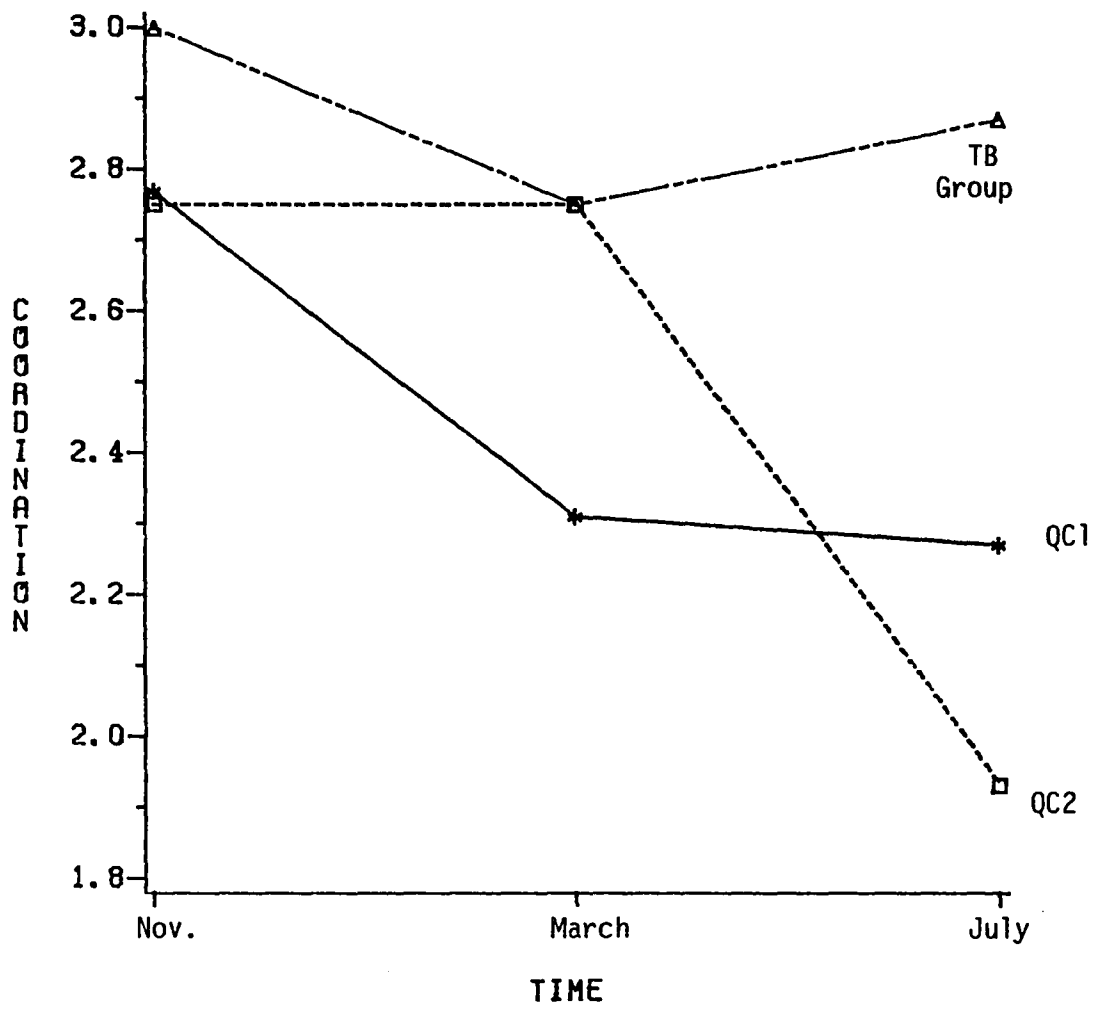


Figure 6.6. Changes in Coordination.

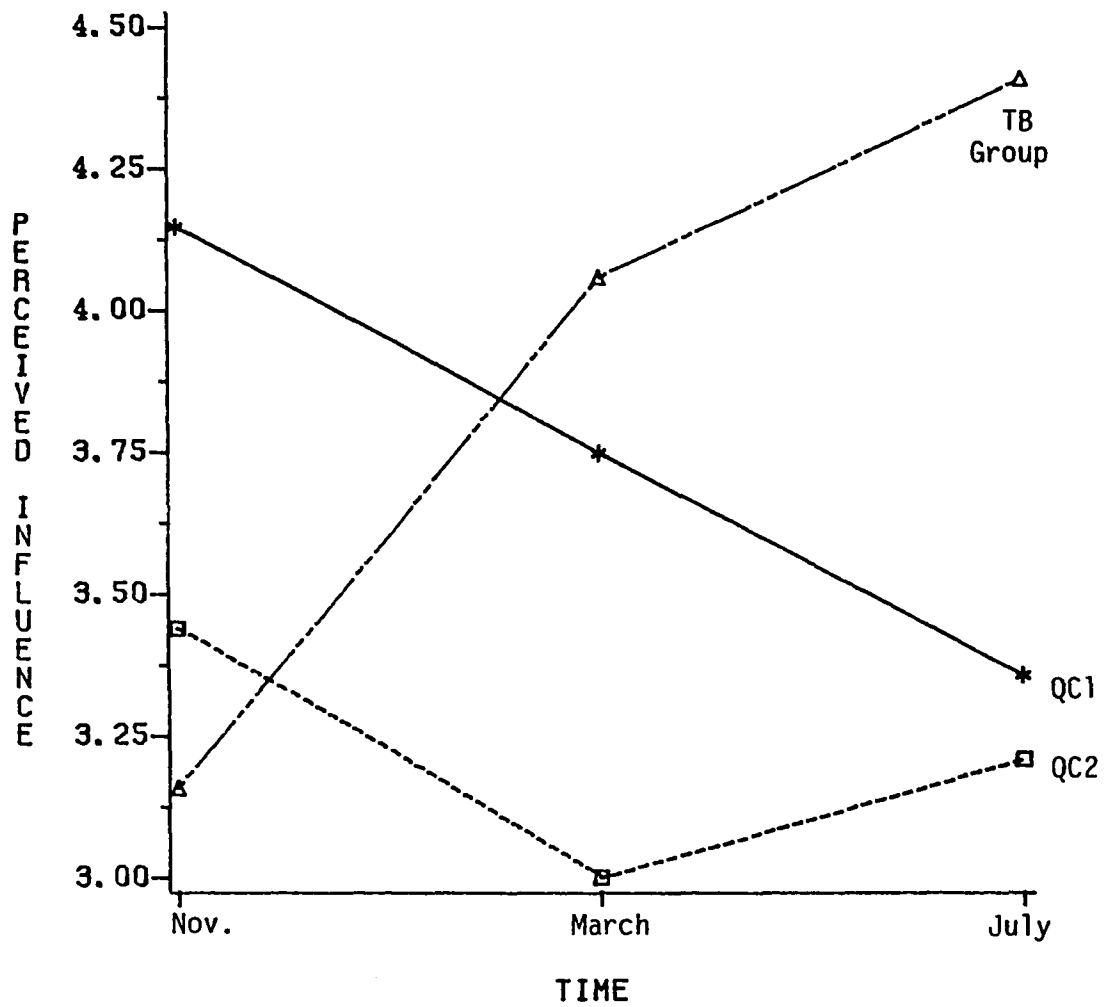


Figure 6.7. Changes in Perceived Influence.

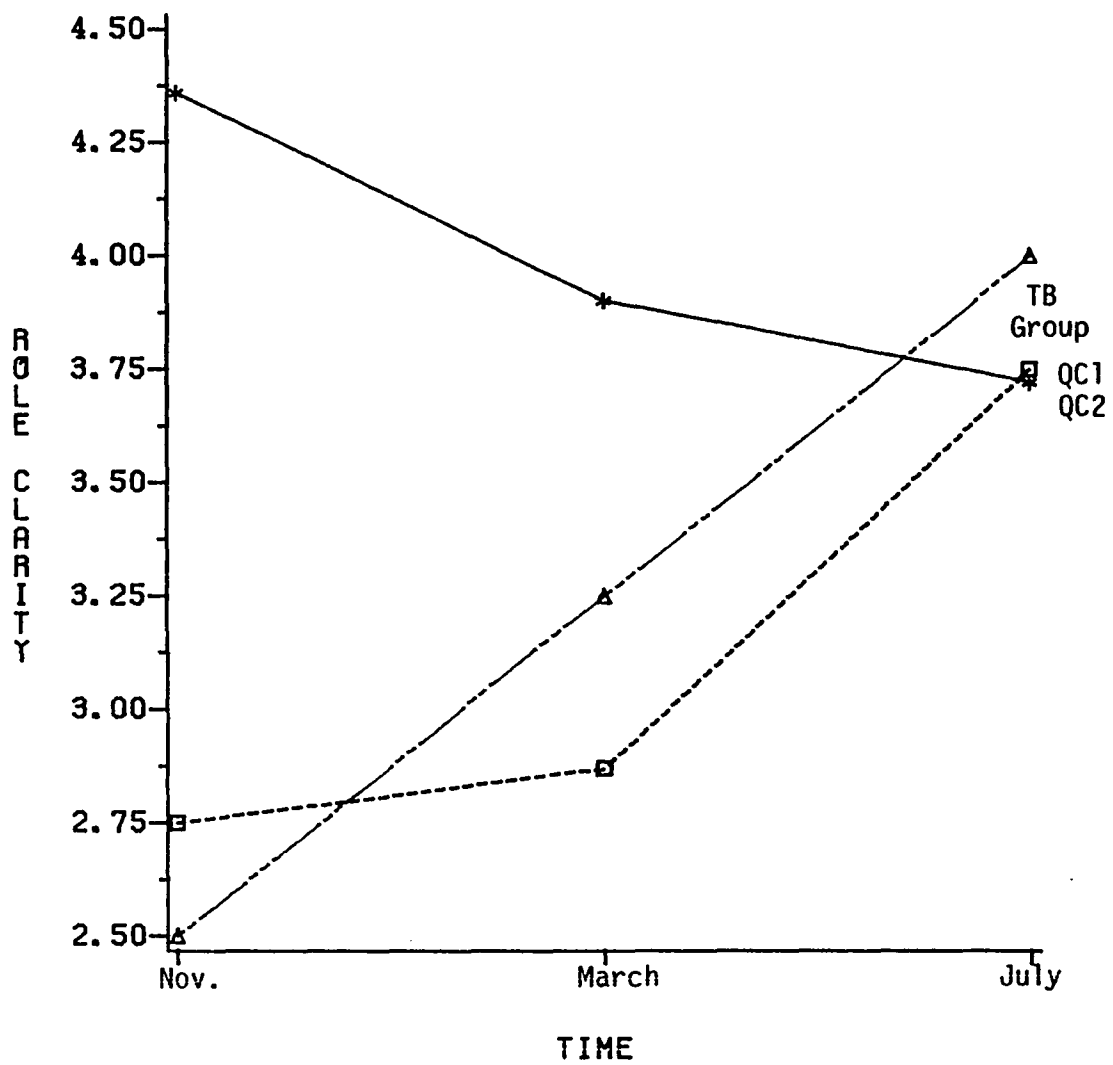


Figure 6.8. Changes in Role Clarity.

Table 6.4. Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables of QC1 with those in TB Group

ANALYSIS OF VARIANCE

EFFECT.....GROUP

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	.74603	3.67181	8.00	10.0	.029
HOTELLINGS	2.93745	3.67181	8.00	10.0	.029
WILKS	.25397	3.67181	8.00	10.0	.029

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	8.04785	29.63636	8.04785	1.74332	4.61640	.046
ROLE CLARITY	6.84749	9.78409	6.84749	.57553	11.89761	.003
OPEN: COMMUNICN:	.81878	25.60227	.81878	1.50602	.54367	.471
JOB SATISFACTION	6.22249	56.40909	6.22249	3.31818	1.87527	.189
COORDINATION	.00136	9.44602	.00136	.55565	.00242	.961
INFLUENCE	5.31284	11.92401	5.31284	.70141	7.57449	.014
COMMUNICATION	2.17710	5.83459	1.17710	.34321	6.34332	.022
LEADERSHIP	.78954	7.93561	.78954	.46680	1.69139	.211

Table 6.5. Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables in QC 1 with Those in QC 2

ANALYSIS OF VARIANCE

EFFECT.....GROUP

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	.26828	.45830	8.00	10.00	.859
HOTELLINGS	.36664	.45830	8.00	10.00	.859
WILKS	.73172	.45830	8.00	10.00	.859

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	.15311	17.63636	.15311	1.03743	.14759	.706
ROLE CLARITY	4.32117	27.78409	4.32117	1.63436	2.64396	.122
OPEN: COMMUNICN:	1.37799	32.72727	1.37799	1.92513	.71579	.409
JOB SATISFACTION	6.22249	132.40909	6.22249	7.78877	.79891	.384
COORDINATION	.19378	10.72727	.19378	.63102	.30709	.587
INFLUENCE	.47731	19.92401	.47731	1.17200	.40726	.532
COMMUNICATION	1.2427	9.33459	1.2427	.54909	2.27152	.150
LEADERSHIP	.19378	11.78282	.19378	.69311	.27958	.604

Table 6.6. Multivariate and Univariate Tests of Significance for Comparing the Changes in Process Variables of QC2 With Those of TB Group

ANALYSIS OF VARIANCE

EFFECT.....GROUP

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	.68730	1.92323	8.00	7.00	.202
HOTELLINGS	2.19798	1.92323	8.00	7.00	.202
WILKS	.31270	1.92323	8.00	7.00	.202

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
DECISION-MAKING	9.00000	28.00000	9.00000	2.00000	4.50000	.052
ROLE CLARITY	.25000	27.75000	.25000	1.98214	.12613	.728
OPEN: COMMUNIC:	.06250	28.87500	.06250	2.06250	.03030	.864
JOB SATISFACTION	.00000	99.00000	.00000	7.07143	.00000	1.000
COORDINATION	.14062	4.71875	.14062	.33705	.41722	.529
INFLUENCE	2.25000	14.73437	2.25000	1.05246	2.13786	.166
COMMUNICATION	.11111	7.69444	.11111	.54960	.20217	.660
LEADERSHIP	.17361	16.48611	.17361	1.17758	.14743	.707

The same significance tests show that the similarities between groups 1 and 2 (the two QC groups) are much closer than those between groups 2 and 3 (QC2 and the Team Building group). These results render the verification of the third hypothesis inconclusive.

Hypothesis 3. The work group implementing Team Building will experience a significantly higher improvement in the organizational processes than the work groups implementing QC.

When compared to QC 1 the TB group shows a significantly higher improvement in the organizational processes. These results favor the retention of the hypothesis. However, in the case of QC 2 the improvements in the organizational processes do not differ significantly from those of the TB group. Therefore, the hypothesis is rejected. The most probable explanations for these inconclusive results are discussed in Chapter VII.

#### MEASUREMENT OF PRODUCTIVITY

The second question related to research objective IV was:

- 2)a. What kinds of productivity indices do hospital administrators use to monitor QC results?
- b. To what extent do hospital QC improve productivity (as measured using the above indicators)?

Hypothesis 4. Related to this objective was:

Those work groups implementing QC will experience a significant improvement in productivity.

As mentioned in Chapter IV, productivity data were available only for one specific activity of QC 1. Therefore no attempt was made to verify hypothesis 4. However, this hypothesis is still retained within the study because the productivity data of QC 1 (presented below) have some implication on this hypothesis. QC 1 maintained accurate records regarding the processing of requests for retrieving old medical records. These records were filed in the mezzanine area of the warehouse. The rate of production with respect to processing of medical records is best illustrated by expressing the number of medical records retrieved as a percentage of the requests made for retrieving them. The bar charts in Figure 6.9 indicate the number of such records handled by the warehouse expressed as a percentage of the requests made for such processing. The data are presented on quarterly basis from 1981 to 1983. Interestingly, the summer quarter (July, August, and September) shows a marked decrease in handling of records for both 1981 and 1982. As mentioned in Chapter V, this drop in the rate of handling records is explained in part by the reluctance of the warehouse workers to work under extremely hot and poorly ventilated conditions existing in the mezzanine area during that part of the year. After analyzing the problem carefully, the QC took a number of steps to improve the lighting and ventilation in the mezzanine area during the early part of 1983. It is interesting to note here that the summer quarter of 1983 does not show such a drop in handling the records as in the previous two years. Although it is difficult to draw a cause and effect relationship between the intervention and the improvements in the rate of handling medical records, there is

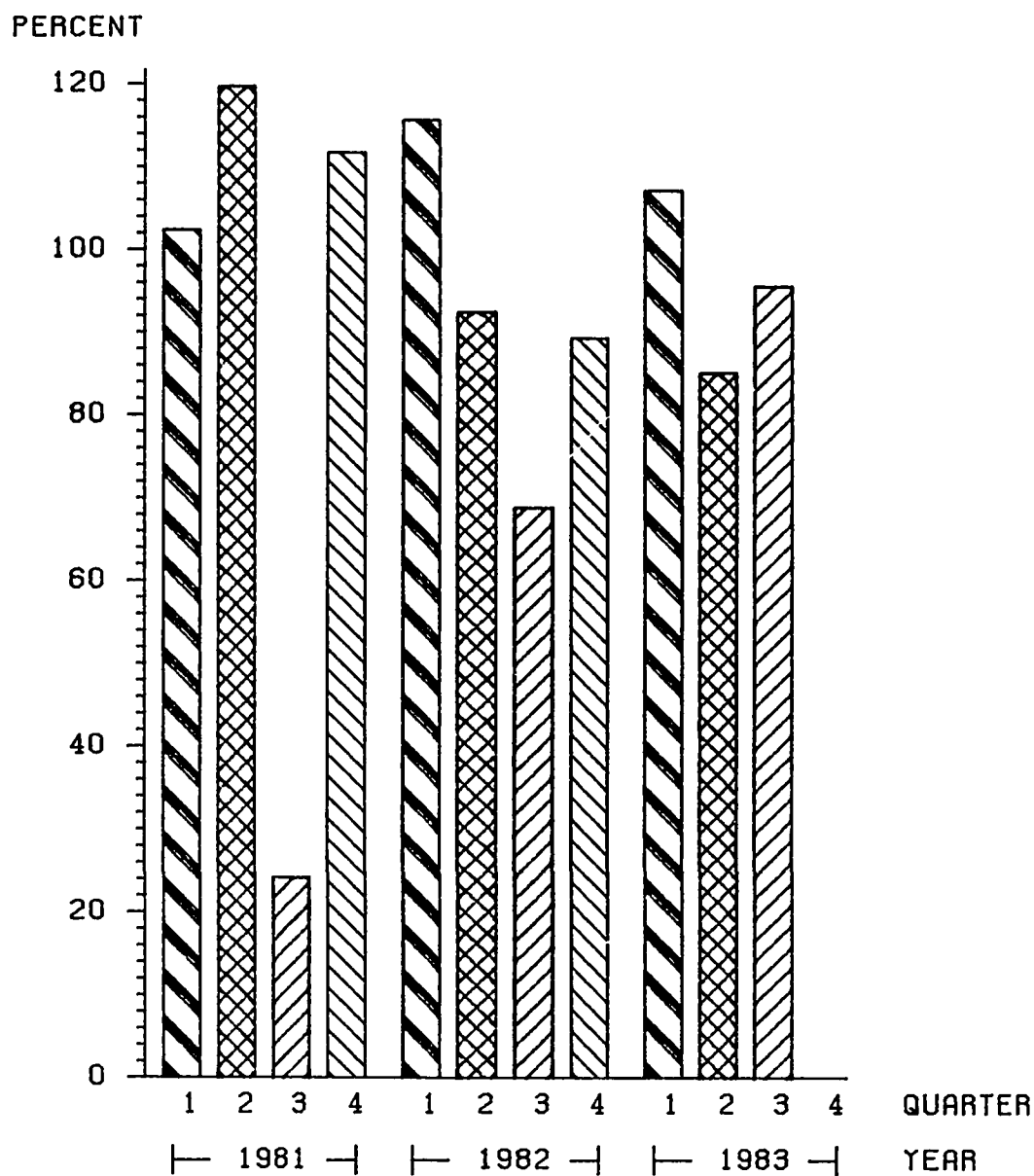


FIG 6.9 HANDLING CLINIC RECORDS BY THE WAREHOUSE 1981 - 1983  
THE PERCENTAGE OF REQUESTS HANDLED PER EACH QUARTER

no doubt that this group has improved its productivity, at least temporarily, during this period.

One of the other problems tackled by QC 1 was the question of "picking errors." A picking error would result from the failure to adhere to the specified qualitative and quantitative descriptions in delivering items from the warehouse to various departments in the hospital. After analyzing the problem carefully, the QC implemented a number of steps to reduce the picking errors. To determine the effectiveness of their solution, the QC also monitored their picking errors from the time they first paid attention to this problem within the circle. Table 6.7 shows the frequency of picking errors from March to September 1983. The intervention to reduce picking errors was

Table 6.7

QC-1, The Number of "Picking Error"  
Recorded, March-September, 1983

Month	The Number of Errors
March	11
April	9
May	21
June	27
July	8
August	10
September	25

instituted in June. It can be seen here that the picking errors have declined for a period of two months after the intervention but they

were soon raised to the pre-intervention levels immediately thereafter. The probable explanations and the implications of these findings are discussed further in Chapter VII.

#### RESEARCH OBJECTIVE IV

The first question related to this objective was:

- 4)a. In comparison to the natural work group do QC provide an added sense of Responsibility, Recognition, Warmth, Motivation and Satisfaction for its members?

The hypothesis assumed that the natural work group would have already provided for a certain amount of responsibility, recognition, etc. and that participation in QC (or TB) would enhance or improve the employee's perception of each of the five attributes. To test this hypothesis, the employees were asked to compare their natural work group with the QC (or the TB group) on the above five attributes using a scale of 1 to 10 (see section D of SWG). Table 6.8 shows the means, standard deviations and the differences in the means for each variable within QC 1 and its natural work group at the beginning of the research study. A positive value for the difference in the means would indicate that QC 1 provides an added amount of each attribute while a negative value would denote that the level of the same attribute within the QC is less than that of the natural work group. The same table shows the results of Student's 't' test for testing the hypothesis that the mean value of each attribute within the QC is higher than the mean for the same variable within the natural work group. These results are insignificant at the .05 level, which shows that the members

Table 6.8. Differences Between QC 1 and Its Natural Work Group in Their Mean Scores on Five Selected Attributes at the Beginning of the Research Study

VARIABLE	N	MEAN	STD. DEV.	T-VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	11	6.4545	2.423	0.0	10	N.S.
QC RESPONSIBILITY		6.4545	2.382			
-----						
WORK GROUP RECOGNITION	11	7.9091	1.136	-1.84	10	N.S.
QC RECOGNITION		7.4545	2.036			
-----						
WORK GROUP WARMTH	11	7.1818	1.471	-0.22	10	N.S.
QC WARMTH		7.0909	1.514			
-----						
WORK GROUP MOTIVATION	11	8.0909	1.578	-1.32	10	N.S.
QC MOTIVATION		7.5455	0.522			
-----						
WORK GROUP SATISFACTION	11	7.7273	1.009	-1.91	10	N.S.
QC SATISFACTION		6.8182	1.328			

\*ONE-TAILED DISTRIBUTION

of QC 1 do not perceive their QC as providing an added amount of any of the five attributes at the beginning of the study. Table 6.9 illustrates the results of the analysis of the same measurements after the employees have participated in the QC for 7-8 months. Again, the insignificant results indicate that the members of QC 1 do not perceive the QC as providing an added amount of any of the five attributes for the entire duration of the research project.

Table 6.10 shows the corresponding results for QC 2 at the beginning of the study. It can be seen that the 't' tests for all the variables, except the one for responsibility, are significant. As such, the QC 2 is seen as providing an added sense of recognition, warmth, motivation and satisfaction for its members even at the beginning of the study. Table 6.11 shows the results of the analysis of the same measurements taken 7-8 months after QC activity. It is clear that the mean differences for all five attributes have increased to a greater degree. At this stage, QC 2 is also perceived as providing an added sense of responsibility.

Tables 6.12 and 6.13 show the corresponding results for the TB group at the beginning and the end of the research study. These results indicate that there is no significant difference in the mean values of all five attributes within the TB and the normal work group in this situation.

The above results render the verification process of hypothesis 5 somewhat inconclusive. Hypothesis 5 states:

In comparison to the normal work group, the QC will be perceived as providing a significantly higher level of

Table 6.9. Differences Between QC 1 and its Natural Work Group in their Mean Scores on Five Selected Attributes at the End of the Research Study

VARIABLE	N	MEAN	STD. DEV.	T-VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	11	6.0000	2.490	1.40	10	.096
QC RESPONSIBILITY		7.0909	2.023			
WORK GROUP RECOGNITION	11	6.2727	2.649	0.92	10	.191
QC RECOGNITION		7.0909	1.758			
WORK GROUP WARMTH	11	6.3636	2.292	1.08	10	.154
QC WARMTH		7.0000	1.844			
WORK GROUP MOTIVATION	11	6.7273	2.494	0.70	10	.251
QC MOTIVATION		7.1818	1.834			
WORK GROUP SATISFACTION	11	6.5455	2.067	-0.71	10	N.S.
QC SATISFACTION		6.8182	1.834			

\*ONE-TAILED DISTRIBUTION

Table 6.10. Differences Between QC 2 and its Natural Work Group in their Mean Scores on Five Selected Attributes at the Beginning of the Research Study.

VARIABLE	N	MEAN	STD. DEV.	T-VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	8	5.2500	1.909	0.09	7	.464
QC RESPONSIBILITY		5.3750	2.774			
WORK GROUP RECOGNITION	8	4.2500	1.389	-.93	7	.0475
QC RECOGNITION		5.500	2.268			
WORK GROUP WARMTH	8	5.000	2.390	2.33	7	.026
QC WARMTH		6.7500	2.121			
WORK GROUP MOTIVATION	8	4.8750	2.588	2.75	7	.015
QC MOTIVATION		7.1250	1.808			
WORK GROUP SATISFACTION		3.000	1.773	3.14	7	.008
QC SATISFACTION		5.8750	1.885			

\* ONE-TAILED DISTRIBUTION

Table 6.11. Differences Between QC 2 and its Natural Work Group in their Mean Scores on Five Selected Attributes at the End of the Research Study.

VARIABLE	N	MEAN	STD. DEV.	T. VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	8	4.6250	1.78	4.50	7	.002
QC RESPONSIBILITY		7.5000	1.604			
WORK GROUP RECOGNITION	8	4.6250	2.387	4.10	7	.003
QC RECOGNITION		8.0000	.926			
WORK GROUP WARMTH	8	5.6250	2.504	3.06	7	.009
QC WARMTH		6.6250	2.446			
WORK GROUP MOTIVATION	8	5.0000	2.268	4.25	7	.002
QC MOTIVATION		6.7500	1.669			
WORK GROUP SATISFACTION	8	4.8750	2.031	3.19	7	.008
QC SATISFACTION		7.5000	1.512			

\*ONE-TAILED SATISFACTION

Table 6.12. Differences Between TB Group and its Natural Work Group in their Mean Scores on Five Selected Attributes at the Beginning of the Research Study.

VARIABLE	N	MEAN	STD. DEV.	T. VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	8	6.500	1.309	-1.00	7	N.S.
QC RESPONSIBILITY		6.0000	1.309			
WORK GROUP RECOGNITION	8	6.5000	1.195	1.00	7	.175
QC RECOGNITION		6.7500	1.165			
WORK GROUP WARMTH	8	7.0000	1.414	-0.36	7	N.S.
QC WARMTH		6.8750	1.126			
WORK GROUP MOTIVATION	8	6.3750	1.598	-0.68	7	N.S.
QC MOTIVATION		6.1250	0.641			
WORK GROUP SATISFACTION	8	6.8750	0.835	0.81	7	.221
QC SATISFACTION		7.2500	1.389			

\*ONE-TAILED DISTRIBUTION

Table 6.13. Differences Between TB Group and its Natural Work Group in their Mean Scores on Five Selected Attributes at the End of the Research Study.

VARIABLE	N	MEAN	STD. DEV.	T. VALUE	D.F.	P-VALUE*
WORK GROUP RESPONSIBILITY	8	6.6250	2.387	0.53	7	.307
QC RESPONSIBILITY		7.2500	2.712			
WORK GROUP RECOGNITION	8	6.6250	1.408	0.26	7	.401
QC RECOGNITION		6.8750	2.167			
WORK GROUP WARMTH	8	7.0000	1.414	-0.36	7	N.S.
QC WARMTH		6.7500	1.282			
WORK GROUP MOTIVATION	8	8.2500	1.165	-1.43	7	N.S.
QC MOTIVATION		7.3750	1.598			
WORK GROUP SATISFACTION	8	6.8750	1.458	-1.07	7	N.S.
QC SATISFACTION		6.1250	1.727			

\*ONE-TAILED DISTRIBUTION

responsibility, recognition, warmth, motivation and satisfaction.

The insignificant results with QC 1 result in the rejection of this hypothesis. The implications of these findings are discussed further in Chapter VII.

In relation to research objective IV (part b) of question 4 was stated as:

- 4) b. Do those QC members with a higher level of Growth Need Strength (GNS) scores perceive a comparatively larger enhancement of the above five attributes (responsibility, recognition, warmth, motivation and satisfaction) than their counterparts with relatively low GNS scores?

To answer this question the members of both QC were divided into two groups: one group of employees with GNS scores less than 36 and the other group with GNS scores greater than or equal to 36. Table 6.14 shows the results of multivariate analysis of variance using the two groups specified above as a factor. The insignificant multivariate and univariate tests of significance indicate that the GNS of the QC members have no effect upon their perception of the five attributes listed above. Based on these results Hypothesis 6 is rejected.

Hypothesis 6 states:

Those QC members with a higher level of growth need strength (GNS) will derive significantly more responsibility, recognition, warmth, motivation and satisfaction from the QC, than their counterparts with relatively lower GNS scores.

Table 6.14. Multivariate and Univariate Tests of Significance for Comparing QC Members with High and Low Growth Need Strength Scores, on Five Selected Attributes

ANALYSIS OF VARIANCE

EFFECT.....GROUP

MULTIVARIATE TESTS OF SIGNIFICANCE

<u>TEST NAME</u>	<u>VALUE</u>	<u>APPROX. F</u>	<u>HYPOTH. DF</u>	<u>ERROR DF</u>	<u>SIG. OF F</u>
PILLAIS	.35222	1.41372	5.00	13.00	.283
HOTELLINGS	.54374	1.41372	5.00	13.00	.283
WILKS	.64778	1.41372	5.00	13.00	.283

UNIVARIATE F-TESTS WITH (2,24) D.F.

<u>VARIABLE</u>	<u>HYPOTH. SS</u>	<u>ERROR SS</u>	<u>HYPOTH. MS</u>	<u>ERROR MS</u>	<u>F</u>	<u>SIG. OF F</u>
RESPONSIBILITY	1.70526	316.40000	1.70526	18.61176	.09162	.766
RECOGNITION	8.00526	374.10000	8.00526	22.00588	.36378	.554
WARMTH	5.05789	116.10000	5.05789	6.82901	.74060	.401
MOTIVATION	3.37778	376.62222	3.37778	22.15425	.15247	.701
SATISFACTION	2.32105	644.10000	2.32105	37.88824	.06126	.807

CHAPTER VII  
SUMMARY OF FINDINGS, DISCUSSION AND IMPLICATIONS  
OF THE STUDY

This chapter opens with a summary and discussion of the research findings. Next, the implications of the study are discussed, from the viewpoint of specifying directions for future research. Finally, a number of recommendations and suggestions for hospital QC programs are outlined.

The Summary of Findings

The main purpose of this study was to generate information useful to the Organizational Development (OD) practitioners in the health care field. A secondary objective was to test a number of hypotheses related to OD theory and contribute to theory building within the discipline. The main findings in these two areas may be summarized as follows:

Findings Related to the Three Groups

Quality Circle 1

- 1) The Structured Naturalistic Observation (SNO) procedure revealed the group member's strong sense of dependency upon the leader for decision-making and providing structure for the meetings. This situation may have resulted from the excessive control exercised by the leader and other outside experts who facilitated the group meetings at different times.

- 2) The Galileo maps showed that the values and attitudes of the group were not conducive for participative decision-making and effecting change within the group.
- 3) Though not statistically significant, the organizational processes of QC 1 declined over the period of research. The only exception was job satisfaction which remained unchanged throughout.
- 4) The QC also demonstrated some improvements in productivity, related to two areas of work. However, the improvements in productivity in one area (picking errors) was short lived.

#### Quality Circle 2

- 1) In contrast to QC 1, QC 2 group showed a strong sense of counterdependence. The group utilized the QC as a forum to confront the autocratic leadership style of its formal supervisor. This process was probably enhanced by the periodic rotation of the QC leadership among the group members.
- 2) The Galileo map showed that QC 2 was a cohesive group which supported the participative philosophy implied in the QC movement. The individual exception to this was evidenced by the group's formal supervisor. He distanced himself away from the participative values of the group as well as from the members who shared these values.

- 3) The organizational processes remained generally unchanged throughout the period of research. The two notable exceptions to this trend were coordination and role clarity. The former variable showed a marked decline in course while the latter improved as the research progressed.
- 4) Though not measured quantitatively, the productivity of QC 2 seemed to have achieved a highly desirable level. This group developed a complete and detailed SOP manual for the department without taking time off from their daily routine, i.e., they were able to devote a significant amount of extra time for this QC activity while maintaining their usual level of productivity.

#### The Team Building Group

- 1) The main problems experienced by this group seemed to be lack of trust, feelings of alienation and subgrouping. These problems were further aggravated by the leaders who unilaterally designed and executed a plan to reorganize the group.
- 2) The Galileo map demonstrated a severe lack of trust among the members of the group.
- 3) The organizational processes of this group showed a gradual improvement throughout the duration of research. The main exceptions to this trend were coordination and leadership. These two variables remained stationary throughout the period of research.

- 4) Corresponding to the improvements in the organizational processes the group began to develop a trusting interpersonal relationship which promoted a mutual exchange of meaningful feedback with each other. However, this process was somewhat retarded by the group leader's (AHS) refusal to subject herself to role negotiation and the exchange of feedback.
- 5) Productivity measurements of this group were not available to the study.

### Findings Related to the Hypotheses

#### Hypothesis 1

Those work groups implementing QC will experience a significant improvement in organizational processes.

#### Hypothesis 2

The work group implementing TB will experience a significant improvement in organizational processes.

Since there were no significant improvements in the organizational processes of the three groups over time, both these hypotheses were rejected.

#### Hypothesis 3

The work group implementing Team Building will experience a significantly higher improvement in the organizational processes than the work groups implementing QC.

As previously mentioned, the organizational processes in the TB group demonstrated a gradual improvement in comparison to the gradual

decline of the same variables of QC 1. The differences in the pattern of changes in the organizational processes were statistically significant. However, no such significant differences were discovered in the pattern of changes in organizational process between the TB group and QC 2. These contradictory results render the verification of Hypothesis 3 as inconclusive.

#### Hypothesis 4

Those work groups implementing QC will experience a significant improvement in productivity.

Hypothesis 4 was not formally tested as there was no productivity data available pertaining to QC 2 and the TB group.

#### Hypothesis 5

In comparison to the natural work group, the QC will be perceived as providing a significantly higher level of responsibility, recognition, warmth, motivation and satisfaction.

The findings in relation to QC 1 indicate that its members do not perceive their circle as providing an added sense or Responsibility, Recognition, Warmth, Motivation or Satisfaction. In contrast, the findings of QC are different from that of QC 1; the members of QC 2 perceived their circle as an important source of added Responsibility, Recognition, Warmth, Motivation and Satisfaction. Again these inconclusive findings prevents us from drawing firm conclusions regarding Hypothesis 5.

### Hypothesis 6

Those QC members with a higher level of growth need strength (GNS) will derive significantly more responsibility, recognition, warmth, motivation and satisfaction from the QC than their counterparts with relatively lower GNS scores.

The two groups of QC members (with high and low GNS scores) did not show any significant difference in their perception of these five characteristics. Therefore the hypothesis was rejected.

### Discussion of the Findings and Implications of the Study

An article published in the November, 1981, issue of Training and Development Journal contained a note by Rensis Likert. In this note which may have been his final contribution to the field of OD, he stated:

Quality Circles are the newest game in town. Many U.S. firms are playing it in the hope that it will help to solve their problem of employee commitment and improve productivity . . . Whether these firms will hit the jackpot or lose their shirts in the process depends in large part on the climate of the organization, its management style and the way Quality Circles are introduced and administered . . . Participative management (system 4) creates a climate and the relationships for Quality Circles to flourish. It makes sure that the members of a Quality Circle are skilled in group decision-making and other ways of operating as a team. In this and other ways, system 4 management makes the success of Quality Circles possible and probable. Authoritarian management (system 2) has the ingredients for their failure. Many companies using system 2 already have cashed in their chips and left the game.

The findings of the current study demonstrate the truism of Likert's observations which reflect more than five decades of experience within the field. The three variables mentioned by Likert,

namely, Management Style, Organizational Climate and the manner in which QC are administered, have figured prominently in the dynamics of the three groups involved in this study.

The leadership style of QC 1's supervisor may best be characterized as approaching a point between "benevolent autocratic" (system 2) and "consultative" (system 3) of Likert's typology. Inadequacies in participative decision-making and resistance to change were the two most characteristic features in the organizational climate of QC 1. These factors of leadership style and organizational climate could have been two important contributors to the decline in the organizational processes of QC 1. This group also demonstrated that it is possible to increase productivity without corresponding improvements in the organizational processes. This finding confirms the previous observations made by Porras (1979). However, the improvements in productivity related to "picking errors" were only transient. This may be indicative of the temporary nature of the improvements in productivity effected by methods involving strict control and direction. One must avoid drawing conclusions about cause and effect relationships between the improvements in productivity and the changes implemented in the work setting. The group underwent many changes during the period of research which included personnel changes, alterations in operating procedures and an intensification of the daily work load due to the expansion of existing facilities. Each of these changes could be propounded as a rival explanation to account for the observed changes in productivity. However, the circumstantial evidence such as the lowering of the temperature in the mezzanine area

to a comfortable level is indicative of at least a partial effect of the intervention upon productivity.

The management style of the Bio-Medical department's supervisor can best be described as autocratic (system 1). Aside from this exception, the interactions and the group processes of QC 2 approached a position between systems 3 and 4 in Likert's typology. The other progressive characteristics of this group included the rotation of the leadership role and the devotion of a significant period of time to deal with problems related to group process. The interactions of this group further substantiate the long-accepted affirmation in leadership theory that the leadership function cannot be considered in isolation from the membership function. The exclusion of the formal supervisor from QC 2, would have transformed that circle into a truly participative (system 4) group. This transformation would have facilitated the processes of problem-solving and decision-making. However, they are bound to encounter many problems when they attempt to implement some of the solutions identified by the circle. The supervisor's disapproval, lack of commitment or animosity could pose considerable hindrances to the QC's progress.

The interactions of the TB group demonstrate the importance of trust as a determinant of a work group's climate (Gibb, 1964). Gibb stated: "In order to participate consciously in his own growth, a person must learn to create for himself, in his dyadic and group relationships, a defense reductive climate that will continue to reduce his own fears and distrusts." Most individuals in the TB group were making a conscious attempt to create this climate. The gradual

improvements in the organizational processes of this group can be attributed to this fact. However, the group's leader (AHS) found it difficult to make that transition. The behavior of the AHS may best be described as a gap between 'espoused' theory and 'action theory' (Argyris, 1973). The support that the AHS provided to the TB group at the beginning of the TB sessions and her decision to participate in its meetings are indications that she espoused the participative values implied in the TB intervention. This is further confirmed by the perception of the group members who placed her in close proximity to the participative values specified in the Galileo procedure. However, in terms of practice theory (theory in action) her behavior was contrary to the values she espoused.

One of the most significant findings in relation to the hypotheses was the lack of improvement in the organizational processes of the two QC groups. Siriniwasan (1982) reported similar findings in a study of QC in business and industry. These findings have significant importance for hospital administrators and OD practitioners who are exploring the possibility of improving organizational processes via QC. However, they must avoid the danger of assuming a direct association between the implementation of a QC program and the improvements in organizational processes. On the other hand, inadequacies in the organizational processes (such as poor communication and lack of participation in decision-making) can hinder the progress of a QC to a considerable extent. This is best illustrated by the interactions of QC 1. The lack of improvement in the organizational processes of the two QC groups may also be a reflection of the inadequacies in the present procedure for training QC facilitators, leaders and members.

The procedure described in most QC training manuals such as the one employed by Hospital-A, do not attach sufficient emphasis upon group process issues and other problems related to the organizational processes. In fact, the QC program in Hospital-A was informed of this shortcoming by the researcher. Consequently, the Director of Organizational Effectiveness Services and the researcher conducted an advanced facilitator training workshop for all the QC facilitators in the hospital. The final evaluation of the workshop revealed that the training sessions helped many facilitators gain insight into a number of problems related to the group and organizational processes.

The same reasons that are responsible for the lack of improvement in organizational processes of the two QC, apply to the five characteristics related to Hypotheses 5 and 6 as well. The consistent improvements in Responsibility, Recognition, Warmth, Motivation and Satisfaction in QC 2, are in agreement with the suggested claim that QC can enhance these characteristics in a work group. On the other hand, the insignificant results from QC 1 caution the practitioner against assuming such an automatic relationship. The contradictory results observed in the two QC suggest that the enhancement of the above characteristics is contingent upon a number of factors such as leadership, values and attitudes of the group and the personalities of the members themselves. The findings related to Hypothesis 6 are also indicative of this same fact. If the enhancement of the above five characteristics is an inherent quality of QC, then the circles should have more appeal to the employees with high GNS scores. The rejection of this hypothesis probably signifies that the suggested association is not something inherent in circles but is more a function of

a number of other factors such as the participative nature of the leadership and the organizational climate.

Some General Comments about the Application of QC in  
Business and in Hospitals

Because QC are credited for much of Japan's improvements in product quality and productivity, they are now being touted as a competitive weapon for American companies. This has led many people to jump too fast onto the QC bandwagon, before thoroughly studying the technique and its potential for practical application. As a result, misunderstandings at all levels of management have created many false and unrealistic expectations. This study suggests that QC are not a panacea for all problems that ail organizations and workers. Experience has shown that the QC process is only applicable to about 10 to 20 percent of the problems in the workplace (Mohr and Mohr, 1983). The present study confirms the validity of this estimate and shows that the QC are mostly effective in discerning technical problems that could become serious impediments to organizational efficiency and effectiveness. This is not to negate the possibility of using QC to solve problems related to organizational processes and interpersonal relationships within the workplace. However, the current QC model that is employed in business and in hospitals seems to be more frequently used for solving technical problems.

Today's health care organizations are plagued with many problems that are not readily amenable to the QC process. Therefore, the use of QC as the only source of organizational change and renewal becomes highly undesirable. If QC are to be optimally useful, the hospital

administrators should realize the limitations of the technique and use it in combination with other broader change strategies of proven effectiveness. Margualis and Adams (1982) provide an excellent summary of the practical applications of other OD interventions in health care organizations.

The final medical care product in any hospital setting is the expression of a concerted effort of many sub-departments and sub-units such as pharmacy, housekeeping, lab and nursing services. Therefore, the improvement of the functioning of one department by a QC program, leaving the others untouched, may not have an appreciable effect on the final medical care product. This makes it necessary that a QC program should involve simultaneously a number of key departments responsible for the delivery of medical care within a hospital.

It is rather unfortunate that the QC are seen only as a motivational tool and a problem-solving forum benefiting the employees at lower levels of the organization. The problem-solving and data analysis techniques used by QC should equally benefit the middle and upper levels of management as well. The techniques of production in most businesses and industries are well-defined, accepted and standardized. For example, the basic procedures for the construction of an automobile are fairly well specified and accepted within the industry. However, in the case of hospitals, the procedures for delivering medical care are not so well defined and standardized. In fact, within the medical care industry, there is a constant need for upgrading the current procedures and for experimenting with innovative and cost-efficient ways of delivering the same medical care product. Therefore, there

is a strong need to move QC process in hospitals to involve higher levels of management and to use QC as a forum for generating new alternatives to the present health care policy.

The QC model that operates in today's hospitals seems to be an exact replica of what is used in business and industry. As a result, the more technically oriented non-clinical departments seem to be the most frequent recipients of a QC program. For example, in the present study, the operations of the hospital warehouse are not much different from that of a business and industrial setting. It is true that the physicians and the other staff directly involved in patient care have very busy schedules. Being pressured for time is the most commonly put forward argument for not implementing QC in direct patient care departments. However, this is the same reason why these departments should implement QC. The reason why the medical care personnel run such busy schedules is because they do not devote enough time for planning and problem solving to consider alternative ways of relieving their workload by improving their level of efficiency. The QC process, if managed efficiently, will help the employee to do more work in 39 hours than they previously did in 40 hours, by working smarter, not harder. It is true that the personnel involved in direct patient care will run into more severe problems with respect to scheduling and maintaining regular meeting times. However, these problems could be overcome with some careful planning. For example, the nurse coordinators involved in the present study handed over their "beepers" during meeting times to an experienced secretary who carefully screened the calls. As a result, the nurse coordinators were disturbed during Team Building sessions only in the case of genuine emergencies.

The following comments apply to QC programs in both business and hospitals.

QC are a complex dynamic process that is not a natural fit to every organization and managerial style. Therefore, prior to undertaking a hospital QC program the OD practitioner should ascertain the values and attitudes of the groups involved, the leadership styles of its supervisors and the organizational climate to ensure that they support the participative ethic implied in the QC movement.

A QC is a problem-solving team. High quality team work based on a sense of trust, intimacy, cohesiveness and the freedom to be innovative are characteristic of all successful QC. Being a part of a team is not a natural human function; it is learned. Learning the QC technique and being a part of a problem-solving team requires patience, perseverance and training on the part of all the individual QC members. Therefore, to derive the maximum benefit from a QC, its members must be skilled in handling group process issues and have the ability to work together as a team. The traditional QC training does not adequately meet these requirements. Therefore, additional training programs or other interventions may be necessary before the group undertakes problem-solving within a QC.

Coercion or pressure within a circle should be avoided at all times. When members are coerced to participate in a circle or to work on a problem which they consider as not appropriate or important, it violates the basic democratic participative principles underlying the QC process. The QC members have the sole right to decide how and when they should participate in the circle activities. When this prerogative is taken away from them by a supervisor or an outside

expert, it could result in a severe loss of confidence, commitment, and morale. Throughout the implementation of a QC program it is necessary that the facilitators and QC leaders should be consistently alerted to this problem. Simultaneously, the members must also be trained to deal with this situation. QC leadership should not be viewed as a definitive role solely incumbent upon the circle's leader. Rather, it must be considered as a function that needs to be fulfilled to ensure the progress of the QC. Therefore, all members of the circle must be trained to identify the components of the leadership function and to assume its responsibilities when deemed appropriate.

#### Directions for Future Research

The outcomes of the present research demonstrate the lack of agreement on effectiveness criteria for measuring the success of hospital QC programs. The desirability of the exclusive use of productivity criteria employed by the QC in business and industry, is questioned. Therefore, one of the more important research priorities in the field is to develop a scheme that includes multiple criteria for assessing hospital QC effectiveness. This scheme should include short- and long-term indices of productivity (e.g., nursing hours/per patient day, the occupancy rates, etc.), the organizational processes and an individual assessment of each problem-solving episode to identify its contribution to the achievement of the institution's goals.

Another implication of the current findings shows that the QC will not succeed in all hospitals and work groups. Therefore, one needs to develop criteria to assess the "readiness" of a work group to undertake an intervention such as QC. This process should include

a study of the group's values and attitudes on a broader scale than what was undertaken in the present study. The Galileo procedure shows much promise as a measurement instrument in this area. In addition, the organizational climate, the managerial style of the groups' leaders; and the group norms related to participative decision-making should be examined.

QC seems to be a technical intervention that is more closely related to managerial engineering than to the human resource oriented traditional OD techniques. Therefore, a combination of QC with Team Building and/or Survey Feedback enhances the chances of the organization to maximize the benefits of the program. The use of such multiple approaches for OD programs in hospitals should be further researched.

Another area that requires more attention by the researchers is the effectiveness of hospital QC under conditions that extend beyond the narrow limits of current QC training programs.

### An Aftermath

In this study, the researcher made an attempt to design a research project from ongoing OD projects in two hospital settings. This study may perhaps be the first of its kind. The research design employed in the study may be considered deficient in many respects, when judged in terms of traditional social science research methodology. The constraints experienced by the study exemplify many realities inherent in organizational research settings. Therefore, they may be the rule rather than the exception. In view of these constraints and shortcomings the findings of the study have been discussed in terms of tentative suggestions and assumptions rather than firm conclusions.

It has been an immense learning experience for the researcher. The results of the study can be appreciated when considered as theory-infirming findings rather than theory-confirming findings. The study has cast many doubts upon previously assumed simplistic and automatic relationships between certain organizational outcomes and the implementation of QC. It is the researcher's hope that these findings will help to strip away some of the "aura" and "faddism" surrounding the technique as well as to assist OD practitioners and hospital administrators in evaluating QC from a more realistic perspective.

APPENDIX A  
GENERAL OBSERVATION FORM FOR USING  
STRUCTURED NATURALISTIC OBSERVATION

Setting: QC Meeting

Site: Material Dept. Conference Room

Date/Time: 8/23/83 -- 10:00 a.m.

Event: Regular Weekly QC meeting of QC-2

Variables: Participation in Decision-Making  
Involvement in QC work  
Leadership .

---

OVERVIEW OF THE EVENT: The main item on the agenda was to review progress regarding the completion of all Standard Operating Procedures (SOPs) by the group members and to make final preparations for the management presentation.

---

DETAILED OBSERVATIONS

1. Meeting called to order by C.U. (QC leader)
2. G. K. (the Supervisor) was absent without any prior notice.
3. The group continued their review of SOPs.
4. Four members presented the final drafts of SOPs assigned to them. They were accepted by the group with a few minor revisions.
5. The status of G.K.'s SOPs is not known. All other SOPs are now completed in final draft format. The group discussed G. K.'s level of participation and his involvement in QC work. It was noted that G. K. was absent from four of the last five meetings. He has not presented even the initial drafts of the SOPs assigned to him.

DECISIONS:

It was decided that the QC leader should send a memo to G. K. outlining the circle members' feelings on this matter. A deadline was set up for him to submit the drafts of all the SOPs assigned to

him by the following week. If he is unable to meet that requirement the rest of the QC members will undertake the task of completing the SOPs which G. K. was responsible for and G. K. will not be allowed to present any SOPs at the management presentation.

INTERPRETATIONS/FEELINGS:

G. K. has been confronted repeatedly in the QC meetings regarding his leadership style. As more and more hostilities are expressed G. K. finds it more and more uncomfortable to participate in the QC meeting. I feel that he is moving farther away from the QC group.

ATTACHMENTS:

1. Memo to G. K. from the QC leader.
2. Minutes of the QC meeting.

APPENDIX B

GALILEO QUESTIONNAIRE

WE WOULD LIKE YOU TO GIVE US YOUR OPINION ABOUT SOME IDEAS RELATED TO THE QUALITY CIRCLE PROGRAM. YOU CAN HELP BY COMPARING THESE IDEAS TO EACH OTHER TO TELL HOW DIFFERENT OR FAR APART THEY ARE, IN RELATION TO ONE ANOTHER. TO HELP YOU TO JUDGE HOW LARGE THE DIFFERENCES ARE WE WILL SAY THAT THE AMOUNT OF DIFFERENCE BETWEEN YOU (ME) AND YOUR HOSPITAL IS 200 UNITS. THE HOSPITAL IS YOUR WORK PLACE. NOW IF WE HAPPENED TO ASK YOU 'HOW FAR APART ARE YOU AND YOUR FAMILY?' THEN, ASSUMING THAT YOU ARE MORE CLOSER TO YOUR FAMILY THAN YOUR WORK PLACE, YOU WOULD WRITE DOWN A NUMBER LESS THAN 200 AS THE ANSWER TO THAT QUESTION. ALSO IF WE HAPPENED TO ASK YOU THE QUESTION 'HOW FAR APART ARE YOU AND YOUR CHURCH?' THEN, ASSUMING THAT THE CHURCH IS FURTHER APART FROM YOU THAN YOUR WORK PLACE, YOU WOULD WRITE DOWN A NUMBER LARGER THAN 200 AS THE ANSWER TO THIS QUESTION.

NOW KEEPING IN MIND THAT YOU AND THE HOSPITAL ARE 200 UNITS APART TRY TO ASSESS HOW FAR APART THE OTHER IDEAS ARE FROM EACH OTHER. IF YOU THINK THAT THEY ARE CLOSELY RELATED OR ASSOCIATED WITH EACH OTHER THEN, WRITE DOWN A SMALLER NUMBER FOR THAT ANSWER. SIMILARLY IF THEY ARE FAR APART AND NOT SO CLOSELY RELATED TO EACH OTHER THEN, WRITE DOWN A LARGER NUMBER. REMEMBER, THERE ARE NO RIGHT OR WRONG ANSWERS BUT ONLY YOUR OPINION.

ID 1-6 card #01 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0102	09-17 ME AND HOSPITAL . . . . .	
0103	18-26 ME AND MY WORK UNIT . . . . .	
0104	27-35 ME AND MY SUPERVISOR . . . . .	
0105	36-44 ME AND THE QUALITY CIRCLE . . . . .	
0106	45-53 ME AND PARTICIPATION IN DECISION-MAKING . . . . .	
0107	54-62 ME AND BEING OPEN TO CHANGE . . . . .	
0108	63-71 ME AND SENSE OF INVOLVEMENT IN WORK . . . . .	
0109	72-80 ME AND TRUSTING OTHERS . . . . .	

-----  
 DUPLICATE 1-6 CARD 02 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0110	09-17 ME AND WORKING AS A TEAM . . . . .	
0111	18-26 ME AND TOP MANAGEMENT OF HOSPITAL . . . . .	
0203	27-35 HOSPITAL AND MY WORK UNIT . . . . .	
0204	36-44 HOSPITAL AND MY SUPERVISOR . . . . .	
0205	45-53 HOSPITAL AND QUALITY CIRCLES . . . . .	
0206	54-62 HOSPITAL AND PARTICIPATION IN DECISION-MAKING . . . . .	
0207	63-71 HOSPITAL AND BEING OPEN TO CHANGE . . . . .	
0208	72-80 HOSPITAL AND SENSE OF INVOLVEMENT IN WORK . . . . .	

-----

## DUPLICATE 1-6 CARD 03 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0209	09-17 HOSPITAL AND TRUSTING OTHERS . . . . .	
0210	18-26 HOSPITAL AND WORKING AS A TEAM . . . . .	
0211	27-35 HOSPITAL AND TOP MANAGEMENT . . . . .	
0304	36-44 MY WORK UNIT AND MY SUPERVISOR . . . . .	
0305	45-53 MY WORK UNIT AND QUALITY CIRCLES . . . . .	
0306	54-62 MY WORK UNIT AND PARTICIPATION IN DECISION-MAKING . .	
0307	63-71 MY WORK UNIT AND BEING OPEN TO CHANGE . . . . .	
0308	72-80 MY WORK UNIT AND SENSE OF INVOLVEMENT . . . . .	

---

## DUPLICATE 1-6 CARD 04 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0309	09-17 MY WORK UNIT AND TRUSTING OTHERS . . . . .	
0310	18-26 MY WORK UNIT AND WORKING AS A TEAM . . . . .	
0311	27-35 MY WORK UNIT AND THE TOP MANAGEMENT . . . . .	
0405	36-44 MY SUPERVISOR AND QUALITY CIRCLES . . . . .	
0406	45-53 MY SUPERVISOR AND PARTICIPATION IN DECISION-MAKING. .	
0407	54-62 MY SUPERVISOR AND BEING OPEN TO CHANGE . . . . .	
0408	63-71 MY SUPERVISOR AND SENSE OF INVOLVEMENT . . . . .	
0409	72-80 MY SUPERVISOR AND TRUSTING OTHERS . . . . .	

---

## DUPLICATE 1-6 CARD 05 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0410	09-17 MY SUPERVISOR AND WORKING AS A TEAM . . . . .	
0411	18-26 MY SUPERVISOR AND TOP MANAGEMENT . . . . .	
0506	17-35 QUALITY CIRCLES AND PARTICIPAN:IN DECISM:MAKING . . .	
0507	36-44 QUALITY CIRCLES AND BEING OPEN TO CHANGE . . . . .	
0508	45-53 QUALITY CIRCLES AND SENSE OF INVOLVEMENT . . . . .	
0509	54-62 QUALITY CIRCLES AND TRUSTING OTHERS . . . . .	
0510	63-71 QUALITY CIRCLES AND WORKING AS A TEAM . . . . .	
0511	72-80 QUALITY CIRCLES AND TOP MANAGEMENT . . . . .	

---

## DUPLICATE 1-6 CARD 06 7-8

	<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0607	09-17 PARTICIPN:IN DECIN:MAKING: AND BEING OPEN TO CHNG:. .	
0608	18-26 PARTICIPN:IN DECIN:MAKING: AND SENSE OF INVOLVEMENT .	
0609	27-35 PARTICIPN:IN DECIN:MAKING: AND TRUSTING OTHERS. . . .	
0610	36-44 PARTICIPN:IN DECIN:MAKING: AND WORKING AS A TEAM . . .	
0611	45-53 PARTICIPN:IN DECIN:MAKING: AND TOP MANAGEMENT . . . .	
0708	54-62 BEING OPEN TO CHANGE AND SENSE OF INVOLVEMENT . . . . .	
0709	63-71 BEING OPEN TO CHANGE AND TRUSTING OTHERS . . . . .	
0710	72-80 BEING OPEN TO CHANGE AND WORKING AS A TEAM . . . . .	

---

DUPLICATE 1-6 CARD 07 7-8

		<u>HOW FAR APART ARE</u>	<u>UNITS</u>
0711	09-17	BEING OPEN TO CHANGE AND TOP MANAGEMENT . . . . .	
0809	18-26	SENSE OF INVOLVEMENT AND TRUSTING OTHERS . . . . .	
0810	27-35	SENSE OF INVOLVEMENT AND WORKING AS A TEAM . . . . .	
0811	36-44	SENSE OF INVOLVEMENT AND TOP MANAGEMENT . . . . .	
0910	45-53	TRUSTING OTHERS AND WORKING AS A TEAM . . . . .	
0911	54-62	TRUSTING OTHERS AND TOP MANAGEMENT . . . . .	
1011	63-71	WORKING AS A TEAM AND TOP MANAGEMENT . . . . .	

---

## APPENDIX C

### SURVEY OF WORK GROUPS QUESTIONNAIRE

The quantity and quality of work produced by most work groups depend to a large extent on their ability to work together as a team. The purpose of this survey is to gather information about how well people work together within the work units involved in the Quality Circles and the Quality of Service programs. The questionnaire will help us to identify the strengths as well as the weaknesses within your work group. Later we can start addressing some of these issues and problem areas within the Quality Circle or Quality of Service projects. A second assessment with the same instrument will help us to know whether the problems that we have identified have been addressed or not, and whether the solution of these problems have improved the productivity of the work group.

Therefore it is important that you answer each question as thoroughly and frankly as possible. This is not a test and there are no right and wrong answers. Your individual responses will not be identified. Complete confidentiality will be maintained throughout and only the aggregate results will be reported to the group and the management.

#### Instructions

Most questions have five possible responses. Before answering each question, read over all the response categories carefully. Then select only one response that represents your thinking (i.e., your answer) to that question and circle the number below that response.



8. Indicate any other major or field specializations which you may have obtained in addition to the formal educational qualificatons listed above:
- 

SECTION-B

THE FOLLOWING QUESTIONS REFER TO YOUR WORK UNIT WITHIN YOUR HOSPITAL FOR THE PURPOSE OF THIS QUESTIONNAIRE THE FOLLOWING TERMS HAVE THESE DEFINITIONS.

Organization - Means Your Hospital

Supervisor - The person to whom you directly report

Work Group (or Work Unit) - All those persons who report to the same supervisor as you

Coordination - Effective planning together, cooperation by various work units and by members within a particular unit

9. Out of the following five modes of decision making which is the most frequently used in your work group?

The decisions are made by the Supv. alone	The decisions are made by the Supv. after consulting w/ a few individuals within the work grp.	The decisions are made by the Supv. after consulting w/ all the members of the work grp. individually	The decisions are made by the Supv. after consulting w/ the entire grp. in a meeting	The decisions are evolved by the grp. as a whole often w/ the agreement of most of the members.
1	2	3	4	5

10. How much influence or say do you have within your work unit on:

	None	Little	Some	Quite a Bit	Very Much
(a) Setting up the goals & objectives	1	2	3	4	5
(b) Deciding the operating rules & procedures	1	2	3	4	5

	None	Little	Some	Quite a Bit	Very Much
(c) In handling the exceptions to the rules & procedures	1	2	3	4	5
(d) In setting the pace of your own work	1	2	3	4	5

11. How much effort do you put into your day-to-day work within your Hospital?

None	Little	Some	Quite a Bit	Very Much
1	2	3	4	5

12. How much did you try to improve job performance in the past 3 months?

None	Little	Some	Quite a Bit	Very Much
1	2	3	4	5

13. How much personal accomplishment do you feel whenever you do well on your job?

None	Little	Some	Quite a Bit	Very Much
1	2	3	4	5

14. In doing your day-to-day work to what extent does your work group get all the necessary information from your supervisor & the people above him/her.

To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
1	2	3	4	5

15. How receptive are your supervisor & the people above him/her to ideas & suggestions coming from your group?

Very receptive	Receptive	Receptive at times unresponsive at others	Quite unresponsive	Very unresponsive
1	2	3	4	5

Not Once	About 1-3 times per mo.	About 1-3 times per wk	About every day	Several times a day
-------------	----------------------------------	---------------------------------	-----------------------	---------------------------

---

16. To coordinate the work of your unit during the past three months how often were written reports or memos sent or received.

(a) among unit members	1	2	3	4	5
(b) between unit people & outside of your unit.	1	2	3	4	5

Not Once	About 1-3 per mo.	About once a wk.	About 2-4 a wk.	Once a day or more
-------------	-------------------------	------------------------	-----------------------	--------------------------

---

17. During the past 3 mos. how often did work related discussions (face-to-face or telephone occur on one to one basis?

(a) Between you and any other member of your work grp. (including your supv.)	1	2	3	4	5
(b) Between you and people outside of your unit.	1	2	3	4	5

	To a very little extent	To a little extent	To some extent	To a great extent	To a very great extent
18. During the past 3 mos. to what extent did you experience problems in coordinating work activities?					
(a) Among unit members	1	2	3	4	5
(b) With people out- side the unit.	1	2	3	4	5
19. Within your work unit to what extent do you have to overcome red tape to get things done?	1	2	3	4	5
20. To what extent are you clear about the goals and objectives of your work unit?	1	2	3	4	5
21. To what extent are you clear about what people expect you to do on your job?	1	2	3	4	5
22. To what extent are there times on your job when one person wants you to do one thing and another wants you to do some- thing else?	1	2	3	4	5
23. When considering various situations that arise in performing your work, what percent of the times do you have standard procedures for dealing with them irrespective of whether they are written or unwritten?					

0-20%	21-40%	41-60%	61-80%	81-100%
1	2	3	4	5

	Very dis- satis- fied	Quite dis- satis- fied	Some- what satis- fied	Quite satis- fied	Very satis- fied
24. How satisfied are you with each of the following:					
(a) your job as a whole	1	2	3	4	5
(b) your pay	1	2	3	4	5
(c) your supervisor	1	2	3	4	5
(d) your co-workers	1	2	3	4	5
(e) opportunities for promotion within your organization	1	2	3	4	5
(f) the amount of responsibility given to you in your job	1	2	3	4	5
(g) the degree of challenge offered by your job	1	2	3	4	5
	To a very little extent	To a little extent	To some extent	To a great extent	To a Very great extent
25. Does your supervisor have knowledge of what it takes to be a good leader	1	2	3	4	5
26. Does your supervisor have the necessary administrative skills	1	2	3	4	5
27. Does your supervisor's attitude encourage participation and commitment from work group members	1	2	3	4	5

- |  | To a<br>very<br>little<br>extent | To a<br>little<br>extent | To<br>some<br>extent | To a<br>great<br>extent | To a very<br>great<br>extent |
|--|----------------------------------|--------------------------|----------------------|-------------------------|------------------------------|
| 28. To what extent are the communications open and honest within your work group | 1                                | 2                        | 3                    | 4                       | 5                            |
- 
- |  | Not<br>once | About<br>once a<br>month | About<br>every<br>2 wks | About<br>once<br>a wk | More<br>than once<br>a week |
|--|-------------|--------------------------|-------------------------|-----------------------|-----------------------------|
| 29. During the past 3 months how frequently were unit or staff meetings held within your work unit | 1           | 2                        | 3                       | 4                     | 5                           |
30. Describe the major strengths of your work unit.
31. Describe the major weaknesses of your work unit.
32. In your opinion what are the specific organizational changes that are necessary to improve the effectiveness of your work unit.
1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
33. Indicate below in order of importance three criteria that can be used to assess how well your work unit performs its work.
1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_

## SECTION-C

People differ in the kinds of jobs they would most like to hold. The questions in this part give you a chance to express what it is about a job that is most important to you personally. For each question below two different kinds of jobs are briefly described. You are to indicate which of these two jobs you personally would prefer if you had to make a choice between them. In answering each question assume that everything else about the jobs is the same. Pay attention only to the characteristics actually listed. One example is given below:

<u>Job A</u>					<u>Job B</u>	
A job requiring work with mechanical equipment most of the day					A job requiring work with other people most of the day.	
1-----2-----		③	-----4-----		-----5	
strongly prefer A	slightly prefer A	neutral	slightly prefer B	strongly prefer B		

If you like working with people and working with equipment equally well you would circle the number 3 as has been done in this example.

34.

<u>Job A</u>					<u>Job B</u>	
A job where the pay is very good					A job where there is considerable opportunity to be creative and innovative.	
1-----2-----		3	-----4-----		-----5	
strongly prefer A	slightly prefer A	neutral	slightly prefer B	strongly prefer B		

35.

<u>Job A</u>					<u>Job B</u>	
A job where you are often required to make important decisions.					A job with many pleasant people to work with.	
1-----2-----		3	-----4-----		-----5	
strongly prefer A	slightly prefer A	neutral	slightly prefer B	strongly prefer B		







46. Group Responsibility - the degree to which the group members feel that they can make decisions and solve problems without checking with superiors each step of the way.

Work Group											
No responsibility is given to the group	1	2	3	4	5	6	7	8	9	10	There is a great emphasis on group responsibility
	1	2	3	4	5	6	7	8	9	10	
Quality Circle											

47. Recognition - the degree to which the members feel that they are being recognized and rewarded for good work rather than being criticized or punished when something goes wrong.

Work Group											
Members are ignored, punished and criticized	1	2	3	4	5	6	7	8	9	10	Members are recognized and rewarded positively.
	1	2	3	4	5	6	7	8	9	10	
Quality Circle											

48. Warmth and Support - the feeling that the members trust one another, offer support to each other establishing friendly relationships.

Work Group											
There is no warmth and support within the group	1	2	3	4	5	6	7	8	9	10	Warmth and support are very characteristic of the group.
	1	2	3	4	5	6	7	8	9	10	
Quality Circle											

49. Motivation - the degree to which the members are self-motivated to perform effectively on the job. They put in a great deal of effort into the job on their own and derive a sense of personal accomplishment in doing their work well.

Work Group											
Members are indifferent; they put in only the minimum effort required for the job; their feelings are not affected by how well the job is done	1	2	3	4	5	6	7	8	9	10	Members are highly motivated; they put in a great deal of effort into the job on their own and derive a sense of personal accomplishment in doing their job well
	1	2	3	4	5	6	7	8	9	10	
Quality Circle											

50. Satisfaction - the feeling of happiness and content derived as a result of being a member of the group. The state of being satisfied with the outcomes and the accomplishments of the group.

Work Group

The members are extremely dissatisfied, unhappy, and they even think of quitting the group	<table border="0"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> <tr> <td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td><td><hr/></td> </tr> </table>	1	2	3	4	5	6	7	8	9	10	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	Quality Circle
1	2	3	4	5	6	7	8	9	10													
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>													

The members are  
extremely happy,  
satisfied, and  
they always look  
forward to meeting  
and working within  
the group

51. Why did you decide to join the quality circle program?
52. If you have had any training in quality circle techniques, please describe them here.
53. What potential benefits do you see for yourself within the quality circle program?
54. If you wish to make any other comments regarding the quality circle program, please write them down here.

## BIBLIOGRAPHY

- Adams, B. J. "Circle Leaders--The Selection Process." Transactions of the Fourth Annual IAQC Conference. St. Louis, MO., 1982.
- Argyris, C. "The CEO's Behavior: Key to Organizational Development." Harvard Business Review 51(2), 1973.
- Argyris, C. and Schon, D. A. Organizational Learning: A Theory of Action Perspective. Reading, Mass.: Addison-Wesley Publishing Co., Inc., 1978.
- Ariyaratne, A. T. A Struggle to Awaken. Sarvodaya Shramadana Movement. Sri Lanka, 1978.
- Austin, K. "The Tomcat Pack (Quality Circles) at Hughes Aircraft." Transactions of the First Annual IAQC International Conference, San Francisco, CA., 1979.
- Bagozzi, R. P. "Sales Performance and Satisfaction as a Function of Individual Difference, Interpersonal and Situational Factors." Journal of Marketing Research, Nov. 1978.
- Baird, J. "Quality Circles May Substantially Improve Hospital Employees' Morale." Modern Health Care, September, 1981.
- Barnett, G. A., Serota, K., and Tylor, J. "Campaign Communication and Attitude Change: A Multidimensional Analysis." Human Communication Research 2, 3 Spring, 1976.
- Barnett, G. A. "Reliability and Metric Multidimensional Scaling. Unpublished Research Report. University of Illinois, Urbana, IL, 1972.
- Beer, M. Organization Change and Development: A Systems View. Santa Monica, California: Good Year Publishing Co., Inc., 1980, 246-247.
- Bennis, W. G. Changing Organizations. New York: McGraw-Hill Book Company, 1964.
- Blake, R. R. and Moutan, J. S. The New Managerial Grid. Houston, TX: Gulf Publishing Company, 1978.
- Braybook, D. and Lindblom, C. E. A Strategy of Decision. New York: Free Press, 1970, 81-110.
- Brody, E. "Japan's Quality-Control Circles Fall Flat for American Hospital Industry." Modern Health Care, Jan., 1982.

- Brook, R. H. et al. "Effectiveness of Non-Emergency Care via an Emergency Room." Annals of Internal Medicine, 1973, 78.
- Brown, F.H.I. Stress, Social Support and Adjustment: A Study of the Nursing Profession. A Doctoral Dissertation submitted to the University of Hawaii, 1982.
- Buback, K. "The Implementation of QC at Henry Ford Hospital." The Quality Circle Digest, 1, Nov., 1981.
- Burke, W. W. Organization Development, Principles and Practices. Boston, Toronto: Little, Brown and Company, 1982, 337-340.
- Campbell, D. T. and Stanley, J. C. Experimental and Quasi-Experimental Designs for Research. Boston: Houghton Mifflin Co. 2nd ed., 1966.
- Campbell, D. T. "Degrees of Freedom and the Case Study" in Qualitative and Quantitative Methods in Evaluation Research, ed. Cook, T. D. and Reichardt, C. S. Beverly Hills: Sage Publications, 1979.
- Carlson, H. C. "A Model of Quality of Work Life as a Developmental Process" in Trends and Issues in O.D.: Current Theory and Practice, ed. W. W. Burke and L. D. Goodstein. San Diego: University Associates, 1980.
- Cole, R. E. "Made in Japan--Quality Control Circles." Across the Board, Nov. 1979.
- Danes, J. and Woelfel, J. "An Alternative to 'Traditional' Scaling Paradigm in Mass Communication Research: Multidimensional Reduction of RATIO Judgements of Separation. Paper presented to the International Communication Association, Annual Meeting. Chicago, IL., 1975.
- Dunn-Rankin, P. Scaling Methods. Hillsdale, NJ: Lawrence Erlbaum Associate Publishers, 1983.
- Einstein, A. Relativity: The Spacial and General Theory. New York: Crown, 1961.
- Everett, E., Loftes, D. E., Phillips, T. R., Berg, D. H., and Williams, J. E. Hospital Quality Circle Programs--A Research Report. Atlanta, Georgia: Avatar International, Inc., 1983.
- French, W. L, and Bell, C. H. Organization Development. Englewood Cliffs, NJ: Prentice-Hall Inc., 1978, 14-18.
- Geldbach, P., Klein, W., and Moore, R. "Quality Control Circles Solving OR Problems." AORN Journal, December, 1981.
- Gibb, J. R. "Climate for Trust Formation" in T-Group Theory and Laboratory Method, ed., Bradford, L. P., Gibb, J. R. and Benne, K. D. New York: John Wiley and Sons, 1964.

- Goodfellow, M. "Quality Control Circle Programs: What Works and What Doesn't?" Quality Progress, 14, 1981.
- Green, P. and Carmone, F. "Marketing Research Application of Non-Metric Scaling Methods, in Multidimensional Scaling, Vol. 2, Applications, ed. Romney, K. and others. New York: Seminar Press, 1972.
- Gryna, F. M., Jr. Quality Circles: A Team Approach to Problem Solving. New York: AMACOM, 1981.
- Hackman, J. R. and Oldham, G. R. Work Redesign. Reading, Mass.: Addison Wesley, 1980.
- Helmer, F. T. "Quality Circle Application in Nursing." The Proceedings of the 13th Annual Conference of the Health Services Division of the American Institute of Industrial Engineers. San Diego: American Hospital Association, 1982.
- Hersey, P. and Blanchard, K. H. Management of Organizational Behavior: Utilizing Human Resources, 3rd edition. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1977.
- Hoffman, R. L. "Group Problem Solving." Group Processes, 2nd ed., ed., Leonard Berkwitz. New York: Academic Press, 1978.
- Hunt, B. "Measuring Results in a Quality Circles Pilot Test." The Quality Circles Journal 4, 1981.
- Illich, I. Medical Nemesis. New York: Pantheon, 1976.
- Ingle, S. Quality Circles Master Guide. Englewood Cliffs, NJ: Prentice-Hall Inc., 1982.
- Irving, R. R. "QC Circles Spur Productivity, Improve Product Quality." Iron Age, June, 1978.
- Johnson, D.E.L. "Quality Circles Put Workers in Charge of their Productivity." Modern Health Care, Sept., 1981.
- Jones, L. and Young, F. "Structure of Social Environment: Longitudinal Individual Differences Scaling for an Intact Group." Journal of Personality and Social Psychology 24, 1972.
- Kahn, R. L. "Organizational Development. Some Problems and Proposals." Journal of Applied Behavioral Science 10, no. 4, 1974.
- Kanarick, A. "The Far Side of Quality Circles." Management Review 70, 1981.
- Keefe, J. P. "Part-time Facilitation." The Quality Circles Journal 4, August, 1981.

- Lawler, E. E. III and Ledford, G. E. "Productivity and the Quality of Work Life." National Productivity Review 1, 1981-1982.
- Likert, R. Associates, Inc. A Systems Approach to Organizational Effectiveness, 1978.
- Likert, R. The Human Organization: Its Management and Value. New York: McGraw-Hill, 1967.
- Likert, R. Associates Inc. and University of Michigan/Institute for Social Research. Survey of Organizations. San Diego: University Associates Inc., 1980.
- Likert, R. Associates Inc. "How to Win the Quality Circle Game." Training and Development Journal, Nov., 1981.
- Lindsay, W. M. "Can Quality Circles Bridge the Japanese American Culture Gap." Transactions of the Fourth Annual I.A.Q.C. Conference. St. Louis, MO., 1982.
- Margulis, N. and Adams, J. D. Organizational Development in Health Care. Reading, Mass.: Addison Wesley, 1982.
- Macy, B. A. The Decade Ahead: Productivity and Quality of Work Life. Lubbock, TX: The Texas Center for Productivity and Quality of Work Life, Texas Tech University, 1981.
- Mather, H. G. et al. "Acute Myocardial Infarction: Home and Hospital Treatment." British Medical Journal 3, 1971.
- McKeown, T. The Role of Medicine: Dream, Mirage or Nemesis? London: Rock Carling Fellowship. Nuffield Provincial Hospitals Trust, 1976.
- Metz, E. J. "Caution: Quality Circles Ahead." Training and Development Journal, Aug. 1981, 71-76.
- Mohr, W. L. and Mohr, H. Quality Circles. Reading, Mass.: Addison-Wesley, 1983.
- Moore, R., et al. "On the Scene: Quality Control Circles at Barnes Hospital." Nursing Administration Quarterly, Spring, 1982.
- Murrin, T. J. "Productivity Improvement in the 80's." Los Angeles Business and Economics, 5, 1980.
- Myrdal, G. Asian Drama, An Inquiry into Poverty of Nations, Vol. I. Baltimore, Md.: Penguin Books, 1968.

- Nadler, D. A., Perkins, D.N.T. and Hanlon, M. "The Observation of Organizational Behavior: A Structured Naturalistic Approach," in Assessing Organizational Change, eds. Seashore, S. E., Lawler III, E. E., Mirvis, P. H. and Camman, C. New York: John Wiley & Sons., 1983.
- Nakazato, H. "The Present Status of QC Circle Activities in Japan," in QC Circles: Application Tools and Theory, eds., Amsden, D. M. and Amsden, R. T. Milwaukee, WI.: American Society for Quality Control, 1976.
- National Council on Health Planning and Development. Productivity and Health: Papers on Incentives for Improving Health Productivity. U.S. Department of Health and Human Services D.H.H.S. Publication No. (HRA) 80-14025, 1980.
- Nelson, D. J. "What Motivated People Can Do." Transactions of the Second Annual I.A.Q.C. International Conference, San Francisco, CA., 1980.
- Ouchi, W. Theory Z. Reading, Mass.: Addison-Wesley Publishing Co., 1981.
- Pfeiffer, J. W. and Jones, J. E. "O.D. Readiness." The 1978 Annual Handbook of Group Facilitators. University Associates, 1978.
- Pfifferling, J. H. "The Wounded Healers." Medical Self Care, 10, 1980.
- Porras, J. I. "The Comparative Impact of Different OD Techniques and Intervention Intensities." The Journal of Applied Behavioral Science 15, 1976.
- Rehder, R. R. "What American and Japanese Managers are Learning from Each Other." Business Horizons, 24, 1981.
- Rendall, E. "Quality Circles--'A Third Wave' Intervention." Training and Development Journal, March, 1981.
- Rogers, E. M. and Shoemaker, F. F. Communication of Innovations. New York: The Free Press, 1971.
- Schein, E. H. "Does Japanese Management Style Have a Message for American Managers?" Sloan Management Review, Fall, 1981.
- Serota, K. and others. "Precise Procedures for Optimizing Campaign Communication," in Brent, R., ed., Communication Year Book I. Transaction Books, 1977.
- Silver, G. Family Medical Care: A Report on the Family Health Maintenance Demonstration. Cambridge, Mass.: Harvard University Press, 1963.

- Sirinivasan, C. Influence of Quality Circles on Productivity, Group Behavior and Interpersonal Behavior: An Exploratory Micro-Organizational Development Perspective. A Doctoral Dissertation submitted to the University of Northern Colorado, Greeley, Colorado, 1982.
- Stewart, D. E. Innovation and Communication: A Study of Behavior and Attitudes Among Farmers in Otago, New Zealand. Doctoral Dissertation submitted to the University of Otago, Dunedin, New Zealand, 1979.
- Strauss, A. L. Medical Organization, Medical Care and Low Income Groups. A draft paper written for the Institute of Policy Studies, Washington, D.C., n.d.
- Terry, K. and Alexander, T. "Quality Circles in the Hospital." Hospital Forum, May-June, 1982.
- Tortorich, R., Thompson, P., Orfan, C., Layfield, D., Dreyfus, C. and Kelley, M. "Measuring Organizational Impact of Quality Circles." Quality Circles Journal, 4, 1981.
- Van De Ven, A. H. and Ferry, D. L. Measuring and Assessing Organizations. New York: John Wiley and Sons, Inc., 1982.
- Waszak, J. J. "Adapting QC to Health Care: Some Special Challenges." Hospital Progress, August, 1982.
- Webb, E. J., Campbell, D. T., Schwartz, R. D., Sechrest, L. Unobtrusive Measures: Non Reactive Research in Social Sciences. Chicago: Rand McNally, 1966.
- Weisboard, M. R. "Why Organization Development Hasn't Worked (So Far) in Medical Centers." Health Care Management Review, Spring, 1976.
- White, S. E. and Mitchell, T. R. "Organization Development: A REview of Research Content and Research Design." Academy of Management Review, 1, April, 1976.
- Woelfel, J. "How to do a Galileo Study." Unpublished paper. Communication Institute, East-West Center, Honolulu, Hawaii, 1977.
- Woelfel, J. "Metric Measurements of Cultural Processes." A paper presented to the Annual Meeting of Speech Communication Association, Chicago, IL., 1974.
- Yager, E. G. "The Quality Control Circle Explosion." Training and Development Journal, April, 1981, 98-105.

Zahra, S. A. An Exploratory Empirical Assessment of Quality Circles.  
Doctoral Dissertation submitted to the University of Mississippi,  
1982.

Zaltman, G. and Duncan, R. Strategies for Planned Change. New York:  
John Wiley and Sons, 1977.